BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, SEPTEMBER 8th, 1934

B. COLI INFECTIONS: AETIOLOGY AND TREATMENT*

BY

D. M. LYON, M.D., D.Sc., F.R.C.P.Ed.

PHYSICIAN TO THE ROYAL INFIRMARY, EDINBURGH; PROFESSOR OF THERAPEUTICS AND CLINICAL MEDICINE IN THE UNIVERSITY OF EDINBURGH

The colon bacillus in the healthy individual is a harmless saprophyte, which possibly assists in the later stages of digestion. Under certain conditions it seems to be the organism responsible for infections in almost any part of the body. Inflammatory lesions in or adjacent to the alimentary canal are often due to this organism, and apart from these the sites most frequently affected are the urinary tract and the gall-bladder. In all cases the original source of the infection is doubtless the bowel, and much inquiry has been directed to the methods of spread to the secondary sites. The organism grows most freely in the caecum and ascending colon, where the contents of the bowel are still fluid, but the drier conditions in the lower colon are less favourable to it, and many die off. Some bacilli also exist in the lower ileum, though never in great numbers unless stasis be present. The neighbourhood of the duodenum is usually sterile. It was long believed that the healthy intestinal mucosa offered an effective barrier to the passage of organisms from the bowel. This does not seem to be strictly true, for several workers have confirmed the observation of Adami[1] that organisms may penetrate the wall of the bowel without causing any lesion during their passage. Doubtless lymphatic glands and liver serve as additional lines of defence. Warren and Whipple,[2] by *x*-ray application, destroyed the epithelium over large areas of the small intestine, and found that no massive invasion took place, though some organisms reached the neighbouring glands. Recent opinion suggests that a few organisms are constantly leaving the bowel, to be rendered harmless in the body.[3]

Infection of the Urinary Tract

There has been much controversy concerning the path by which colon bacilli may reach the urinary tract, but neither clinical nor experimental evidence is sufficient to give a conclusive answer. It is possible that under suitable conditions the organisms may pass by any of the paths suggested. Spread may occur by natural passages, by lymphatics, by the blood stream, or by a combination of these. At several points the alimentary canal and the renal system lie in close contact, separated only by a little connective tissue, and direct penetration may take place. In such situations lymphatic plexuses may offer a more ready path. There may also be invasion of the portal veins or of the general circulation by way of the thoracic duct. Ascending infection in the urinary tract is believed to occur along the lymphatics which surround the ureter. In females there may be direct spread across the perineum to the lower urethra, but upward extension along the lumen is usually considered unlikely, even when gross obstruction exists.[4] That urinary infection occurs more frequently in female infants at the diaper stage has been held to favour passage spread, but Nabarro[5] has drawn attention to certain fallacies, and in any case the lesion appears most commonly in the right kidney before the bladder is involved. Most writers now seem to prefer the theory of blood spread to the kidney. If this be so, organisms circulating in the blood stream should reach other parts of the body, and should affect both kidneys equally, yet the right is involved much more frequently than the left. This theory also fails to explain why women are more liable to pyelitis than men.

Much experimental work has been done in trying to elucidate the problem. The feeding of large quantities of foreign *B. coli* to dogs resulted in the appearance of some organisms in distant tissues, and in the urine in three cases out of four.[6] Direct injections into the blood stream have given information of rather negative value. The healthy circulation appears to possess an enormous protective capacity, for even when billions of organisms are introduced into a vein urinary infection may fail entirely,[7] and the blood may be sterile within an hour.[8] In similar experiments Book found that bacteria did not appear in the urine for many hours, and then only if local foci had been developed in the kidneys.[9]

Peritoneal injection of large quantities of *B. coli* culture result in a rapid appearance of the organisms in the blood stream,[10] and some can be recovered from the urine within half an hour.[11] Thiele and Embleton[11] describe some interesting observations. They painted organisms in the anterior urethra of guinea-pigs, and found that they were rapidly conveyed by lymphatics to the capsule of the kidney and then by lymphatic paths to the general circulation. None were carried directly to the bladder. Reinfection of the body appears to occur readily from the urinary tract. Barrington and Wright[4] investigated the blood before and after minor operations on the urethra. In a large percentage of cases slight trauma to the mucosa was followed by the arrival of organisms in the blood within a few minutes. The bacilli disappeared within half an hour.

Many observers have shown that the colon bacillus does not readily establish itself in the blood stream or in the urine in healthy animals. It would seem that factors other than the mere presence of the organisms are necessary for a lasting implantation.

Age and Sex Incidence

B. coli infections of the urinary tract may develop at any level from a urethritis to pyelonephritis and perinephric abscess. Pyelitis is probably the commonest

* Read in opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

lesion, while others are so mild as to suggest a bacilluria. Some writers consider these terms unjustified, and believe that there is always some underlying invasion of the kidney substance[12 26]; it should be remembered, of course, that only the more severe cases are examined by the pathologist. Urinary infections occur at any age, and are more frequent in females, both infants and adults. In males they are seldom found unless some obstruction is already present. When lesions affect different levels of the urinary tract the kidney is usually involved earlier than the bladder. Debilitating conditions, the presence of other disease, exposure to cold, fatigue, overexertion, starvation, undernutrition, and addiction to alcohol and drugs will undoubtedly favour infection by lowering resistance. These may affect either the bowel or the urinary tract.

Many practitioners have considered constipation and intestinal stasis important factors, but proof is difficult because of the frequent occurrence of these. Colitis, ulceration, diarrhoea, and the abuse of purgatives are equally important. Walker[4] has proposed that a dose of cascara should be given to test whether a case of bacilluria has been completely cured. Such a dose will result in a reappearance of organisms in the urine if health has not been restored. No claim has been put forward that foreign bacteria in the bowel are more likely to gain entrance to the body. In the urinary tract the most important factor seems to be the presence of some obstructive lesion which interferes with free drainage. Experimentally this is also true, though the lesion may be very slight; obstruction of the urethra for as short a time as fifteen minutes may enable an infection to occur.[13] In men enlarged prostate, stricture, and calculus favour infection, also nerve lesions such as tabes. Enforced rest after an operation, and unduly long retention of urine from any cause, are also said to be of importance. Mechanical causes, such as prolapse and external pressure, act in the same way. Pyelitis is common about the middle of pregnancy, and this may depend on the dilatation of the right renal pelvis, which is almost constant in this condition.[4] The presence of foci in the gall-bladder or appendix may keep up a bacilluria.

Gall-bladder Infection

Infection of the gall-bladder may take place in much the same way as in the case of the urinary tract. Organisms may reach the liver by the systemic or the portal blood vessels, by lymphatics, and by the common bile duct. The bile, though alkaline, is an excellent culture medium for the colon bacillus and similar organisms. Typhoid bacilli are believed to reach the liver by the blood stream, and colon bacilli may arrive by the same path. Hurst[14] has pointed out that where achlorhydria is present the contents of the duodenum are more alkaline—a condition favouring the growth of organisms—and retrograde infection of the biliary system is more likely in such cases. He also states that laparotomy, when followed by complete inhibition of gastric secretion and movement for a time, will allow *B. coli* to appear in the stomach within twenty-four hours.

In the gall-bladder the bacilli attack the walls, and so form a focus from which the bile can be constantly reinfected. As in the case of the urinary tract, the mere presence of organisms in the biliary system is probably not the only factor. Williams and McLachlan, studying the bacteriology of the gall-bladder, formed the impression that the *B. coli* and streptococci which were found were secondary invaders, enabled to settle down because of some toxic or chemical injury to the parts.[15] The presence of gall-stones favours infection, and these depend to some extent on the occurrence of a high blood cholesterol, though bacteria may also play a part in their formation. Anatomical abnormalities and mechanical faults leading to stasis or defective drainage of the gall-bladder are also of importance. Again, the presence of other foci of infection may predispose. Hurst reports that 37 per cent. of cases of cholecystitis had appendix scars.[14]

Septicaemia

Despite the apparent ease with which intestinal organisms invade the blood stream, true *B. coli* septicaemia is comparatively rare. Experiments already quoted have shown that even after massive infection the organisms fail to maintain themselves in the circulation. On the other hand, transient bacteriaemia is probably very much more common than is usually supposed. Barrington and Wright have shown that organisms frequently reach the blood from the urethra if the urine is already infected[8]; Baird, who investigated the blood after labour, found coliform organisms within a few minutes of delivery, though they rapidly disappeared after an hour.[16] He also draws attention to the danger of urinary infection in the puerperium from inability to pass water for some hours post partum.

As in the case of the local lesions, other factors appear to be essential for the development of septicaemia. It has been suggested that many cases of *B. coli* septicaemia may really be the overflow of bacteria from some local focus, such as the appendix or gall-bladder.

Treatment of B. coli Infections

A knowledge of the factors which permit an invasion of the body by the colon bacillus suggests measures which may be taken to prevent the infection: avoidance of debilitating and exhausting conditions, and the correction of all lesions which interfere with free drainage in the urinary and biliary systems. As the bowel is undoubtedly the original source of all infections, special attention should be directed to its proper functioning. Constipation must be corrected, but, in dealing with this, drastic purgatives must be avoided, as these carry fluid contents and more active organisms to the lower colon, and it has been shown that this may cause an exacerbation of the distant infection.[4] Diarrhoea must be controlled, and other lesions of the bowel should be attended to.

The importance of such conditions is beyond doubt, but there may be other less obvious factors which favour invasion of the body. Colon bacilli isolated from distant lesions are usually of the same types as are commonly present in the alimentary canal, and it has not been held that foreign strains are more prone to cause infections. The importance of increased numbers of active *B. coli* in the small intestine or in the distal colon is more difficult to assess. In health the proportion of the various groups of organisms in the faeces is practically constant,[17] but in certain conditions the stools may show an unusual preponderance of one or other type. Recognition of such abnormalities would warrant an attempt to correct them.

The so-called intestinal antiseptics are probably of little assistance, for in doses which are safe they cannot possibly sterilize the gut, and little is known of their effect on the various kinds of bacteria. Calomel in non-purgative doses is probably as useful a drug as any, and sulphur may also be of service. Many practitioners rely on preparations of liquid paraffin and agar for keeping the bowel in order. High colon lavage may be employed to get the lower bowel into a healthy state. An attempt may be made to alter the intestinal flora by implanting *B. acidophilus* and by giving lactose. Whole-wheat bread, uncooked starches—such as oatmeal—and sour meal preparations have been proposed for the same purpose.[3 18] There

is a certain amount of evidence that excess fat in the diet favours penetration of the bowel wall by organisms[7]; butter and eggs are therefore usually restricted. Almost all writers agree that milk should be avoided during the acute stages of renal infections, and meat is usually also restricted.

Measures to Raise Resistance

In dealing with *B. coli* infections bacteriological measures have not proved as satisfactory as might have been expected. This is probably due to the fact that the term "colon bacillus" does not represent one organism (as *B. typhosus* does), but includes some scores of different though closely related germs. Vaccine therapy has proved of service in the case of other infections, especially where the condition has become chronic, and benefit might be anticipated in the case of *B. coli* lesions. Opinions on this matter are very varied, and the usual belief appears to be that vaccines are seldom helpful. In view of this uncertainty it might be well to rely on autogenous preparations whenever possible.

Introduction of the bacteriophage has suggested interesting therapeutic possibilities. The interaction of phage and bacteria is so specific that it is unlikely that stock preparations can be of universal service. Few writers have claimed success in *B. coli* infections, and most have expressed doubt as to whether the method is worth the trouble it involves. Cowie[19] gives a good account of the elaborate steps which are necessary to develop a satisfactory phage for each individual patient, but the results he reports seem to justify the special technique.

The bacteria of the colon group are said to produce two toxins—an endo- and an exo-toxin. Antisera have been produced against *B. coli* which are claimed to be both antitoxic and antibacterial.[20,21] Even polyvalent sera can only be made against a few strains of organisms, and this probably explains why inconstant and unsatisfactory results are obtained.

Treatment of Urinary Infections

Some infections of the urinary tract are extremely mild and clear up spontaneously, others with tissue invasion and destruction may defy all attempts at cure. The majority lie between these extremes. For the acute phase treatment is standardized, but the chronic stages require individual measures. In acute cases the patient must be put to bed and kept uniformly warm. Large quantities of fluid should be given, together with alkalis, and perhaps an antispasmodic, such as hyoscyamus. Milk, meat extracts, and soups should be avoided; barley water, fruit juices, and glucose drinks should make up the fluid intake to three or four pints a day. Many writers suggest that copious flushing of the urinary tract is by far the best remedy for these infections.

By Administration of Alkalis

Alkalis are also very helpful in the early stages, and it has been stated that if alkali treatment were more efficiently carried out there would be fewer chronic cases.[22,23] The colon bacillus can grow in media ranging from *p*H 4.4 to 9.4, and flourishes best between *p*H 6 and 7, a little to the acid side of neutral. Relief of symptoms may be obtained with relatively small doses of alkali which scarcely affect the *p*H, and even very large amounts of alkali can hardly raise the *p*H above 8,[24] at which value the organisms can still grow. The beneficial action has not been satisfactorily explained, since the change in *p*H hardly seems sufficient. The alkalis most commonly employed are potassium citrate and sodium bicarbonate up to 150 or even 300 grains of each in the twenty-four hours. One or more doses may also be given during the night. These salts should be continued for several days after the temperature becomes normal, but they are apt to cause depression if kept up too long. It is often useful to have each specimen of urine tested with litmus paper to make certain that sufficient alkali is being given. In children, after the subsidence of symptoms, the urine should be kept mildly alkaline for weeks, and in pregnancy the alkalis should be continued to the end of term.

By Acidifying the Urine

When satisfactory administration of alkalis has not been successful in relieving the condition, the effect of acidifying the urine should be tried. Alternate periods of seven to ten days on alkali, and then on acid, may prove more successful than the continued use of either. The production of an acid urine is a necessary preliminary to the use of hexamine. Dilute acids are seldom used for this purpose, but acid sodium phosphate is usually employed. This salt will readily change alkaline urine, but it does not have much effect on a urine already acid. Ammonium benzoate is probably better, but it also fails to carry the acidity beyond the normal range. The acidifying chlorides of ammonium and of calcium act in a different way, and can produce a lower *p*H. They are apt to cause nausea and general upset, and a highly acid urine tends to irritate the urinary tract.

The Action of Hexamine

In trying to modify the reaction of the urine the character of the diet is of the greatest importance, for if the foods yield an alkaline ash extra acid will be required to overcome it. A large series of internal antiseptics have been prepared for sterilizing the urinary tract, but none is perfect. Disinfection of a healthy canal is comparatively easy, but organisms which have penetrated the walls of passages are beyond their action. Another difficulty is to attain a sufficient concentration of the drug in the urine. Of the urinary antiseptics hexamine is probably that most generally used. It acts by liberating formaldehyde, a change which takes place only in an acid medium. A solution of 1 in 5,000 is bactericidal, but such a concentration is probably never attained in the urine. It is doubtful whether 1 in 20,000 is often exceeded, and at such a concentration the growth of *B. coli* would only be inhibited. In addition, some of the drug is probably decomposed in the gastric juice, especially if it is given after meals. Acid-forming salts must be given at a sufficient interval from the hexamine, so that interaction will only occur in the urine. The combination of antiseptic and acid urine may be very irritating in the urinary tract, and this treatment must be avoided in acute infections, since haematuria or even strangury may be produced. In an alkaline urine the hexamine is excreted unchanged. It is interesting to note that certain writers believe that here, as in the alkaline bile, hexamine can benefit the patient in some other way than by producing formaldehyde. Some *B. coli* infections clear readily with hexamine and an acid urine, but lesions in the kidney and renal pelvis are less easily controlled, as little formaldehyde may be evolved at this level. Failure with hexamine is undoubtedly due to the difficulty in obtaining a sufficient concentration of the antiseptic.

Hexyl-resorcinol is said to be germicidal in either acid or in alkaline urine. It has a remarkable effect in rapidly clearing up coccal infections of the lower urinary tract, but in other respects it is not better than other antiseptics.[24] *B. coli* infections may require months of treatment where other organisms disappear in a short time. The fluid intake should be restricted during the

use of this drug, to increase its concentration in the urine.

Dyes of the pyridine series have recently been employed as urinary antiseptics. They also can be used without regard to the reaction of the urine, and it is claimed that they can penetrate the walls of the tract and so exert an antiseptic action in the tissues. The flavine series have been used by mouth, intravenously, and for local irrigations. They have the advantage that their action is not impaired by the presence of serum. Euflavine is probably the best of the group, the urine being made alkaline with sodium bicarbonate. In chronic cases a succession of such remedies can be tried. Attention must be directed to possible foci of reinfection, and any factor which may cause stasis or retention must be dealt with. In certain cases, as in pregnancy, the indwelling ureteral catheter is of temporary advantage.

The Ketogenic Diet

The observation that the urine of diabetics with acidosis and of epileptics under the ketogenic diet did not readily become infected suggested the use of this type of diet in cases of urinary infection. To produce the appearance of ketone bodies in the urine a very strict dietary control is essential. The diet contains large quantities of fat, and the carbohydrate has to be restricted to between 20 and 30 grams. After a few days on this strict regime acetone bodies begin to appear in the urine, and the *p*H may fall to about 5. Tested on a group of chronic cases which had resisted all other forms of treatment, this method proved successful in about one-half the patients, the infection clearing up in remarkable fashion in some of the cases.[23] The ketogenic diet is unappetising and even nauseating, and it is difficult to get patients to co-operate thoroughly for any length of time. It is unlikely that this method of treatment will be much used except in the most resistant cases.

Biliary Infections

The effects of treatment in lesions of the biliary tract can be less easily observed than in the case of the renal system. During the acute phase general measures must be taken against pain and fever. For chronic infections, where surgery is not indicated, other medical methods may be tried. As in the case of the urinary tract, an effort should be made to flush the system. A copious intake of fluid may be helpful in producing a free flow of bile. Drainage of the gall-bladder and biliary passages may be regularly undertaken by introducing concentrated magnesium sulphate through a tube in the duodenum. Specimens of the bile can be withdrawn and examined bacteriologically if care be taken to avoid contamination, but the results so obtained are not very reliable. Hurst[14] finds that magnesium sulphate by mouth (without the tube) is just as efficient. He gives each morning the largest dose of a concentrated solution which the patient can take without being purged. The action may be further enhanced by an injection of pituitrin a quarter of an hour before taking the Epsom salts. Half an ounce of olive oil before meals may stimulate a flow in the same way. Treatment can be reinforced by the administration of sodium salicylate or hexamine; the salicylate is an efficient cholagogue. Hexamine reaches the bile, and is frequently prescribed in conditions of the gall-bladder, but as the medium is alkaline it is difficult to see how it can act. Hurst says that it can clear up an infection in a few days.

In *B. coli* septicaemia a search should be made for a focus of infection which may be constantly passing organisms into the circulation. Intravenous medications are of doubtful value. Mercurochrome has been most often given, but it is not without danger.

REFERENCES

1 Adami, J. G.: *Journ. Exper. Med.*, 1899, iv, 249.
2 Warren, S. L., and Whipple, G. H.: Ibid., 1923, xxxviii, 713.
3 Rooke, A. R.: *Practitioner*, 1925, cxv, 205.
4 Walker, K. M.: *Lancet*, 1930, i, 681.
5 Nabarro, D.: *British Medical Journal*, 1930, ii, 414.
6 David, V. C., and McGill, E. C.: *Journ. Urol.*, 1923, x, 223.
7 Helmholz, H. F., and Milliken, F.: *Amer. Journ. Dis. Child.*, 1922, xxiii, 309.
8 Barrington, F. J. F., and Wright, H. D.: *Journ. Path. and Bact.*, 1930, xxxiii, 871.
9 Book, M. H.: *Amer. Journ. Path.*, 1933, ix, 569.
10 Moody, W. B., and Irons, E. E.: *Journ. Infect. Dis.*, 1923, xxxii, 226.
11 Thiele, F. H., and Embleton, D.: *Proc. Roy. Soc. Med.*, 1914, iii, 69.
12 Cameron, H. C.: *Guy's Hospital Reports*, 1932, lxxxii, 390.
13 Lepper, E. H.: *Journ. Path. and Bact.*, 1921, xxiv, 192.
14 Hurst, A. F.: *Guy's Hospital Reports*, 1932, lxxxii, 396.
15 Williams, B., and McLachlan, D. G. S.: *Lancet*, 1930, ii, 342.
16 Baird, D.: *Edinburgh Obstet. Soc. Rep.*, 1934, p. 69.
17 Alvarez, W. C.: *Physiological Review*, 1924, iv, 353.
18 Redeuill, F. H., et al.: *Journ. Amer. Med. Assoc.*, 1930, xciv, 688.
19 Cowie, D. M., and Hicks, W. C.: *Journ. Lab. and Clin. Med.*, 1931–2, xvii, 681.
20 Weinberg, M., and Prévot, A. R.: *C. R. Soc. de Biol.*, 1933, cxiii, 1029.
21 Vincent, H.: *Amer. Journ. Med. Sci.*, 1932, clxxxiii, 301.
22 Helmholz, H. F.: *Brit. Journ. Child. Dis.*, 1929, xxvi, 247.
23 Ryle, J. A.: *Guy's Hospital Reports*, 1932, lxxxii, 339.
24 Stockman, R.: *Edin. Med. Journ.*, 1927, xxxiv, 396.
25 Band, D., Dunlop, D. M., and Dick, I. L.: *Proc. Roy. Soc. Med.*, 1933, xxvi, 217.
26 Wilkinson, K. D.: *British Medical Journal*, 1930, ii, 412.

CONDITIONS PREDISPOSING TO B. COLI INFECTION AFTER POST-OPERATIVE RETENTION *

BY

CUTHBERT DUKES, M.Sc., M.D.

PATHOLOGIST, ST. PETER'S HOSPITAL; DIRECTOR OF RESEARCH LABORATORY, ST. MARK'S HOSPITAL

The *B. coli* infections of the urinary tract which follow post-operative retention can be studied with a completeness which is not possible in sporadic infections. Tests can be carried out before the operation to find if the urinary organs are healthy, and periodic examinations during convalescence will show at what time and in what circumstances the urine becomes infected. The observer is in the fortunate position of knowing when the patient will be exposed to the risk of infection: he can look for common factors in those who succumb and those who escape.

During the last six years I have had the opportunity of making daily observations on 214 cases of retention of urine following the operation of excision of the rectum for cancer. This operation does not open or directly damage the urinary tract, but like other extensive pelvic operations it disturbs the nervous mechanism of micturition, necessitating catheterization usually for three or four days. In many of these cases urinary sepsis supervenes, the infection being attributable either to instrumentation or to a lymphatic or haematogenous infection from the operation wound. Other patients escape infection. We are discussing the aetiology of *B. coli* infections to-day, and my contribution consists in a demonstration of those conditions which predispose to infection when the function of the bladder is temporarily deranged after surgical operations.

Incidence of Infection

It will help towards an understanding of the question if before describing the factors which predispose to infection in this type of case I mention some which do *not*

* Read in opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

affect the frequency of urinary infections. Changes in nursing personnel, for instance, made no difference to the proportion of urinary infections, and the incidence was approximately the same in each ward of the hospital. It was natural to look into this question because the women patients were all catheterized by sisters and senior nurses. Retention in men patients was relieved by an indwelling catheter with an antiseptic seal,[1] and the fact that only a small proportion of the men patients became infected is a tribute to the good quality of the nursing at St. Mark's Hospital. If less care had been taken with the sterilization and passage of catheters there would no doubt have been a higher proportion of infection. Similarly, it was found that the incidence of infection was approximately the same in the practice of each of the six surgeons on the staff of the hospital, and did not vary in the three operations commonly performed for cancer of the rectum—namely, perineal, abdomino-perineal, and perineo-abdominal excision.

It was also interesting to notice that minor defects in renal function, such as are accompanied by a rise in the blood urea to 50 or 60 mg. or a fall in the van Slyke urea clearance test to 40 or 50 per cent. did not predispose to urinary infection: there was no greater frequency of infection in the group showing these defects compared with other patients whose renal function tests before operation were more satisfactory. More severe defects in renal function would probably have predisposed to urinary infection, but such cases were not accepted as operable.

Causative Factors

Turning to the factors which influence the frequency of urinary infections, much the most obvious is sex. Infections following post-operative retention are much commoner in women than in men. In the whole series

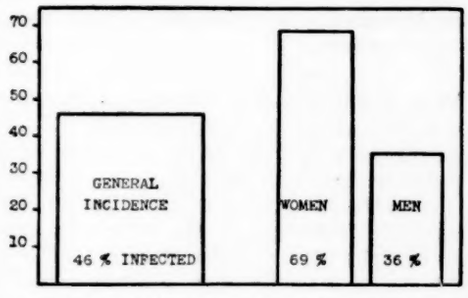


FIG. 1.—Infection following post-operative retention of urine. Incidence in each sex.

of 214 patients, *B. coli* infection developed in ninety-nine (46 per cent.). Infection occurred in forty-seven out of sixty-eight women (69 per cent.), but in only fifty-two out of 146 men (36 per cent.) (see Fig. 1). This higher incidence of infection in women is not unexpected when one considers the difficulty of catheterization in a woman helpless after an extensive pelvic operation. In these circumstances the urine generally becomes infected within twenty-four hours of the commencement of catheterization, and pyuria supervenes two or three days later. In men patients, drained by a self-retaining catheter with an antiseptic seal, it is possible to keep the urine sterile and free from pus for several days. Thus, during the last few years nearly 100 men patients have had a catheter tied in for three to six days without any infection other than a slight urethritis.

Next to sex the most important factor predisposing to urinary infection is old age. The risk of infection increases steadily with advancing years both in women and in men. Of the women under 60 only 62 per cent. became infected after post-operative retention, but in those over 60, 86 per cent. developed *B. coli* infections. Similarly with the men—only 28 per cent. of those under 60 became infected, compared with 47 per cent. of those over this age (Fig. 2). This increased frequency of urinary infections in elderly subjects is attributable in women patients chiefly to loss of muscle tone, and in men to the increasing incidence of prostatic disease. Both these influences result in a longer period of retention, and as a general rule the longer the period of retention the greater the risk of infection.[2]

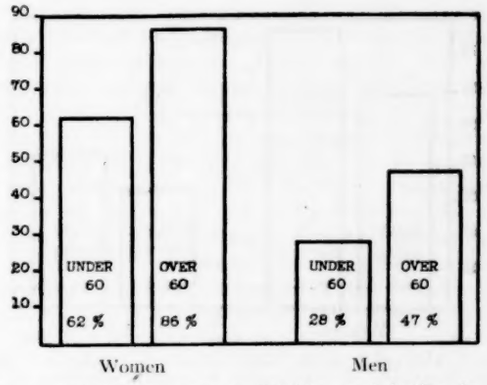


FIG. 2.—Influence of age in liability to infection in post-operative retention of urine.

The relation of the period of retention to likelihood of infection is shown by the fact that in men who suffered from retention for more than three days 38 per cent. became infected, but only 15 per cent. of infections occurred among those whose retention lasted a shorter

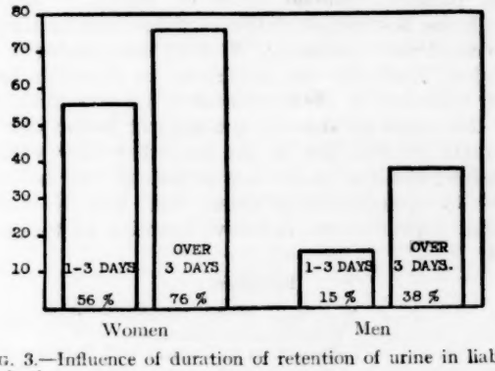


FIG. 3.—Influence of duration of retention of urine in liability to infection.

period. Similarly with the women—infections occurred in 76 per cent. of those requiring catheterization for more than three days, and in only 56 per cent. of those with retention lasting less than three days (Fig. 3).

Discussion

Finally, it is possible to show from this analysis that the patient's general state of health is an important factor in the incidence of urinary infection after post-operative retention. All the patients on whom these observations have been made had undergone the operation of excision of the rectum for cancer. In the early stages of this disease the general health is not impaired, but when the growth has ulcerated extensively and commenced to invade the extrarectal tissues there is a serious decline in the patient's general condition. Early cases are thus in a much better state of health at the time of operation than late cases. The lowered vitality is reflected in the increased incidence of generalized sepsis, and the higher operative mortality rate in the "C" group of cases, in which the glands contain metastases.[3 4]

The influence of the stage of the cancer on the risk of urinary infection is shown by the fact that among women 77 per cent. of the late cases became infected and only 59 per cent. of the early cases. Similarly, among men infections occurred in 42 per cent. of the late cases and in only 32 per cent. of the early cases (Fig. 4). The average age in each group was approximately the same, and it seems justifiable to attribute the increased incidence of urinary infection in the more advanced cases of cancer to a decline in general health.

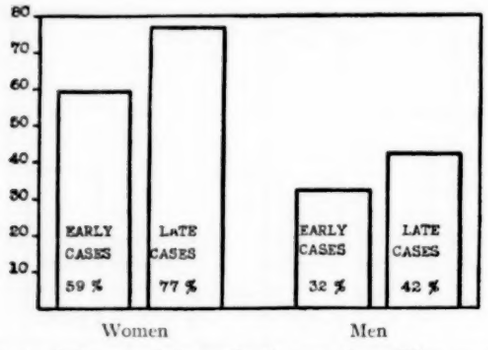


FIG. 4.—Influence of the patient's general condition as shown by the frequency of post-operative urinary infections in early and late cases of cancer of the rectum.

These four factors—sex, age, duration of retention, and general health—are each responsible for considerable variation from the average in the incidence of *B. coli* infections after post-operative retention. The last three are to some extent dependent on each other, the duration of the retention being related to the age group and also to the patient's general state of health. Moreover, although for descriptive purposes these four factors have been considered separately, it must be pointed out, in conclusion, that they all predispose to infection because of their influence on the functional activity of the bladder. From the point of view of the subject under discussion their main interest lies in the fact that they exemplify a principle, familiar in urinary pathology but not always so easy to demonstrate in detail, that urinary infections are often dependent on defective function of the urinary organs.

REFERENCES

[1] Dukes, C.: *Proc. Roy. Soc. Med.*, December, 1928, vol. xxii, Section of Surgery, Subsection of Proctology, p. 1.
[2] Idem: Ibid., May, 1932, Section of Surgery and Urology, p. 1828.
[3] Idem: *Journ. Path. and Bact.*, 1932, xxxv, 323.
[4] Gabriel, W. B.: *Brit. Journ. Surg.*, 1932, xx, 234.

The creation of new slum areas by smoke-polluted atmosphere is to receive special consideration at the annual conference of the National Smoke Abatement Society, which will be held at Glasgow from September 27th to 29th. Dr. J. Johnstone Jervis, medical officer of health for Leeds, will be the chief speaker on the subject of slum clearance and smoke prevention. Dr. J. S. Owens, who is in charge of the investigations into atmospheric pollution on behalf of the Department of Scientific and Industrial Research, and has invented many of the delicate instruments used for the measurement of atmospheric pollution, is to describe the latest developments in this direction. New instruments for the measurement of smoke emission will also be demonstrated. Special consideration is to be given to the effects of smoke upon visibility and aviation, and upon horticulture. The delegates will be given a civic reception by the Lord Provost in the City Chambers, and the discussions will take place in the Council Hall. The chairmen at the various sessions will include Dr. H. A. Des Vœux, president of the society, and Dr. John R. Currie, professor of public health at Glasgow University.

THE VALUE OF RADIOLOGY (DIAGNOSIS AND TREATMENT) AS AN AID TO THE GENERAL PRACTITIONER*

BY

J. H. DOUGLAS WEBSTER, M.D., F.R.C.P.ED.

PHYSICIAN IN CHARGE OF THE RADIOLOGY DEPARTMENT, MIDDLESEX HOSPITAL

The three specialties—surgery, radiology, and pathology—have both a technical and a medical side, and have had eminent exponents of one or both aspects. Radiology occupies a position midway between the other two: it is in many ways ancillary, as pathology and bacteriology are (from the practitioner's point of view), while in other ways it is more independent, as the surgical specialties are. Again, the radiologist can rarely diagnose or treat "at a distance," as is the custom of the pathologist and the bacteriologist. The presence of the patient is usually as essential to him as it is to the surgeon. Radiology is therefore more a clinical specialty than a laboratory specialty.

Some of the more outstanding pioneers in the subject have been better known as biologists than as technicians. Some years ago Sir John Bland-Sutton, in speaking of members of his own craft, drew attention to this distinction, and few will deny that radiologists will be more likely to rise high in scientific reputation and in usefulness to their colleagues and the community when they regard themselves primarily as physicians—physicians who practise in radiology—than when they consider themselves only, or essentially, as technicians. In so far as they take their proper place as medical consultants rather than as technical consultants they will face far greater difficulties, and will have many opportunities, too, for exercising tact, both with patients and with their colleagues, but their value and general usefulness will in time be much greater.

Value of a Diagnostic or Therapeutic Method

The value of a diagnostic method is established by its affording evidence which can throw new light on obscure clinical problems, and still more when it can afford signs of such high value as evidence that they can be called pathognomonic. Radiology, it has been said with much truth, has brought forward a far greater number of such pathognomonic signs in its short existence than all the previous centuries of clinical observation could accumulate. In ancient medicine, and well on into the Middle Ages, physicians found, as they thought, infallible diagnostic and prognostic signs in astrological calculations or "images" (Chaucer): the position of the stars at the time of onset of the illness was generally agreed to be pathognomonic. Magic in diagnosis is less popular now, but in treatment, radium—to the public at large, and even to some members of the profession—has undoubtedly magical properties. The more scientific and less magical bases of diagnosis and prognosis began early in clinical observation, and later on progressed as the study of physical signs grew in accuracy. Thus in auscultation as a method we have relative and absolute examples of value in the discovery of a mitral systolic murmur, which can have one of many different interpretations, as compared with that of the presystolic murmur of mitral stenosis (crescendo, and heard supine). While some radiological authorities, such as Köhler, regard the value of radiological diagnostic evidence as always relative and quite secondary to clinical findings, I rather agree with

* Read in opening a discussion in the Section of Radiology and Electrotherapeutics at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

those others, such as Holzknecht, who consider many roentgenological signs as pathognomonic, or more nearly absolute in value.

A long list of useful and pathognomonic signs could be given, but a few instances may suffice: a timely chest examination, which may reveal early tuberculosis masked as influenza, or miliary tuberculosis masked as enteric; bronchiectatic cavities made evident with lipiodol injection; horizontal fluid levels found in lung abscesses, or in gastro-intestinal diverticula, small bowel obstruction, or sinusitis; the demonstration of early aortic aneurysm, or of early heart enlargement; in the gastro-intestinal tract, the unequivocal signs of ulcer or growth, or of such conditions as diverticulitis and polyposis; again, in the examination of the gall-bladder, kidneys, nervous system, and bones and joints there are a great many signs which can well be called pathognomonic.

The value of a therapeutic method is established when it can relieve and possibly cure more "quickly, safely, and pleasantly" than any other method some or many groups of diseased conditions, and still more when it can show a specific curative action on malign processes which are otherwise intractable. In dermatology, gynaecology, and in almost all the other branches of medicine and surgery, the advances in radiotherapy have been immense; and in many fields, such as inflammatory infections, new discoveries are being made almost yearly—as, for instance, the possible value of treatment of pneumonia by short-wave diathermy, and the *x*-ray treatment of acute and subacute sinusitis and mastoiditis.

By all tests, diagnostic and therapeutic, radiology stands high. In diagnosis it has thrown a flood of light into most of the branches of medicine and surgery, and of its success in therapeutics the same may be said. Thus, apart from the knife or cautery (or to a much less degree foreign proteins and metals), *x* rays and radium are the only agents known to have an influence on malignant growth. This is the unique achievement of radiotherapy.

Good and Bad Radiology

The first criterion of the value of radiology must be that it is *good* radiology, as estimated by the higher current standards of excellence. Radiology is not nearly so established a science yet as pathology or surgery, with the result that there has been in the past, and still is, far too much imperfect radiology in all its branches—diagnostic and therapeutic *x* rays and radium therapy.

As an instance of diagnostic error we may recall the fact that hundreds of recruits for the armies of Great Britain and America were wrongly rejected because of the confident radiological diagnosis of "peribronchial phthisis." The boundaries of the normal and pathological in chest radiographs were not nearly so well established twenty years ago as they are to-day, and many radiologists in the war followed pseudo-scientific dogmas which some had laid down, based on false views of chest pathology. From time to time one still hears of extraordinary instances of wrong interpretations of radiographs. There was the recent case of an eminent foreign doctor who spent many months in bed owing to a wrong *x*-ray diagnosis of "spinal disease" which had been made by a surgeon. Again I may instance a patient who came home from a far-distant colony because of the wrong interpretation of his spasmodic "cascade stomach." He had returned expecting to have a gastric operation, but surgical intervention was shown to be quite unnecessary. Similar and more tragic instances of wrong *x*-ray and radium treatment are not infrequent, as are instances of failure to apply these agents when indicated.

Radiology: Major and Minor

The problems of correct interpretation in diagnostic radiology are so great, and the subject is still so far from fully explored, that Haenisch of Hamburg, for example, in a recent address in America on "Radiology as a Specialty," held that there is (and can be) no "minor roentgenology" corresponding to "minor surgery" or "minor pathology." I doubt, however, whether this position will meet with general agreement. Surely almost all fractures and dislocations, many foreign body localizations, and much of the fields of elementary thoracic and genito-urinary diagnosis can be held to be "minor roentgenology." If we admit no "minor" roentgenology how shall we prevent technical assistants, radiographers, or general practitioners from practising radiology to a greater or less degree? Granted that interpretation is a medical prerogative, it seems to me that technical and elementary diagnostic radiology cannot be restricted to medical specialists in the subject. In the spheres of electrotherapy and actinotherapy much may be said to be "minor," and can well be delegated to qualified biophysical assistants or technicians. On the other hand, in the sphere of radiotherapeutics (*x*-ray and radium therapy), little can be said to be "minor radiotherapy," except perhaps some of its dermatological applications.

Lay unqualified practice in radiology should be forbidden by law, just as the prescription and administration of poisons is legally restricted. An American doctor has reported recently a large number of cases of severe gum and jaw damage resulting from *x*-ray treatment for hypertrichosis administered in beauty parlours.

Radiology as a Specialty: Education

While a new medical science is emerging from the general body of medicine it first proves itself of value to medical and surgical specialists; only later on, when it becomes a consolidated science and art, does it make a wider appeal, reaching the general practitioner and the public. Radiological work is highly appreciated already by our specialist colleagues in medicine and surgery, for the statistics of all radiology departments show that year by year they refer a greater proportion of their hospital patients to us both for diagnosis and for treatment. Radiology has recently been accorded official recognition as a specialty by the institution, by some of the universities and colleges, of diplomas in this science and by insistence on a course of study in the subject by medical students—the general practitioners of the future. For graduate study with a view to specialism a three-years' course is required in some countries, as compared with our one year's special training. In some university hospitals abroad the students receive instruction during their earlier years in the anatomical, physiological, and pathological bases of both diagnostic and therapeutic radiology before the clinical applications are reached. This is an advisable, but at present only, I fear, an idealistic method.

Some raise objection to the overburdening of the undergraduates' curriculum by special teaching in radiology. Students are supposed by some to be able to acquire the knowledge they need in the subject in the wards and out-patient department, but this is impossible; they could gain little in the way of an adequate knowledge of pathology in this manner. Training in any subject must be reasonably full and precise. Take, for example, ophthalmology: here the medical student has to learn all the details of operations, such as those for squint, cataract, and the enucleation of the eye, but he is not likely to put his knowledge into effect by operating on

his patients once he commences private practice. No more is he likely to practise as a radiologist because of an elementary knowledge of the subject. If the curriculum is overburdened, much of what is unnecessary in it should be drastically excised so that sufficient attention can be paid to recent subjects of such great and general importance as radiology.

It is difficult for us to realize how the whole face of medicine and surgery has been changed within the lifetime of most of us by the advent of radiology. Thus the fourth edition (1902) of Osler's *Medicine* had only about 100 words on *x* rays in a monumental volume of nearly 700,000 words of text; and his 1912 edition was much behindhand in its references, failing to note the use of *x* rays in diagnosis of lung tuberculosis or gastric cancer, though it is mentioned as of help in "hour-glass stomach." But in 1907 there were already observations on pulmonary tuberculosis as shown by *x* rays; in 1908 on cancer of the stomach and colon; and in 1911 duodenal ulcer first came into prominence through surgical and radiological advances.

Advance in any new specialty is slow enough owing to internal and external obstacles, but recognition by others of the advances made is even slower. We should realize that the diagnostic and curative possibilities of radiology will largely remain as, so to speak, capital locked up and not put to full use, unless its achievements can be so exhibited as to make a wide appeal to the general practitioners of each country. Many practitioners use it only as the medical defence societies urge—for fractures and dislocations. Others are over-credulous, as the practitioner in America who lately referred a patient to a radiologist for measurement of the mitral valve! Radiology offers an immense range of opportunities for proving its value, and has also very definite limitations: to diffuse more widely accurate knowledge of it the very active Radiological Society of North America has recently organized a three-year campaign of education in radiology throughout the country, and it might be well perhaps if its example were to be followed here. The private practitioners in a country have a unique position; they see the vast majority of patients first of all, and they are thus in a position to advise their patients (for example, in cases of gastric ulcer) whether they will undergo medical, surgical, or other specialist treatments. In addition, practitioners have a very good knowledge of the ultimate results of medical or specialist treatments. Their co-operation, therefore, must be solicited if the general level of health of the community is to benefit by recent advances in medicine.

As to delay in diagnosis, do we not often see patients who have suffered for years from undiagnosed gastric symptoms before a barium meal examination has been suggested? And in the sphere of treatment, how many patients suffering from exophthalmic goitre, leukaemia, and menorrhagia have spent months or years of ill-health with little-availing medical treatment before radiotherapy has been adopted?

Early Diagnosis and Treatment of Cancer

The most important sphere in which the co-operation of the general practitioner is essential is the early diagnosis and treatment of malignant disease. This has been insisted on by all the cancer organizations throughout the world, but it is only by the general practitioners gradually coming to realize the possibilities of radiotherapy that early treatment can be instituted for very many cancer patients. There are two reasons for this: (1) that so many patients are already at an inoperable stage by the time the disease is disclosed or discovered; and (2) that so many patients are not good operative risks or have an invincible repugnance to operation. Because of this, the possibilities of radiotherapy should be widely known, and for each case should be explored without delay. Many of these patients would benefit by being referred directly to the radiotherapist. Professor Regaud has well said that the *first* treatment that the cancer patient has is the all-important treatment, and that it is quite indefensible to take up the attitude of only calling on the aid of the radiotherapist when surgery has proved a failure. On the contrary, the radiotherapy expert should be asked for his opinion before the commencement of each patient's treatment, in case radiotherapy is indicated then or at a later date.

If we consider the statistics of the Ministry of Health as to the number of deaths occurring annually from cancer of different regions—for example, 5,000 or more from cancer of the breast—we may ask: For how many of such cases has adequate radiotherapy been utilized? And where such a valuable aid has not been called in: What circumstances prevented its utilization? It is in the public interest that such questions be asked. I ventured to point this out in an article in the *Lancet* on breast cancer six years ago, but the question still awaits a satisfactory solution.

This discussion would, I believe, prove of permanent value if, under the auspices of the Section in the British Medical Association, or otherwise, steps could be taken towards an active campaign in radiology similar to that which has been carried out in Sweden at intervals in the past twenty years, and has been in progress lately in North America in the medical and lay press. Such campaigns have resulted in Sweden, and ought to result in Anglo-Saxon lands also, in a material raising of the general standard of the public health, and in an increased respect of the public for modern medicine, and for radiology, one of its most recent—and valuable—subdivisions.

RADIOLOGY AS AN AID TO THE GENERAL PRACTITIONER *

BY

E. KAYE LE FLEMING, M.A., M.D., B.CH.

In this discussion I speak as a general practitioner who regards all kinds of specialist treatment as primarily arising from the needs of the general practitioner, and closely associated with, and dependent upon, his interest and co-operation.

In most forms of specialist practice the association between specialist and general practitioner is close, and necessitates consultation between the parties, to the advantage of all concerned. An exception to this relationship exists notably in the case of the bacteriologist and pathologist. Here the assistance required can generally be obtained without a personal interview. Nevertheless, even in this case, I am of opinion that there is a definite loss in the acquisition of knowledge by both parties resulting from the lack of personal discussion and the substitution of written reports.

The relationship between the radiologist and general practitioner may be said to fall somewhere between the ideal of the surgical or medical consultation and the more remote pathological or bacteriological report. My first point is to advocate a more close and personal contact between the radiologist and the general practitioner, for I think that in the peculiar nature of your specialty there is a danger of the tie becoming weakened further

* Read in opening a discussion in the Section of Radiology and Electrotherapeutics at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

or even lost, to the disadvantage of all concerned. The reasons for this may be put under three heads.

1. The science of radiology (especially in its therapeutic aspect) is technically outside the sphere of knowledge of the general practitioner.

2. The science of its application is advancing so rapidly that the general practitioner in busy practice cannot hope to keep pace with it. In the case of those of my own standing in the profession it may be said to have developed altogether since we entered practice.

3. It is necessarily an *expensive* specialty. The general practitioner has to study closely the means of his patient, and must therefore often hesitate to recommend an expensive form of treatment without good knowledge of its nature and its probable efficacy.

With these general observations I turn to the main conditions which experience leads me to seek your assistance, and I have no doubt that if my knowledge of your specialty was more complete there would be fewer gaps in the rather disjointed category which I have made out.

The Field of Diagnosis

(*a*) *Bone Injuries and Misplacements.*—The value of *x* rays needs no emphasis in this class of case. While it is easy to point to the necessity of this kind of examination in all cases (the Medical Defence Union is eloquent on this point) in practice this is not possible. The general practitioner must discriminate to save needless expense. For example, as medical officer to a public school, if I acted literally on this advice I should be sending a daily stream over here to be examined by *x* rays. I I could give more work to the radiologist if there were a simpler and less expensive method of examining minor injuries to show direct fracture or misplacement. I am quite aware of the difficulties involved, and am in no doubt as to the answer I shall receive.

(*b*) *The Thorax.*—I will not do more than acknowledge the great help of *x* rays in locating fluid in the pleural cavity. As regards pulmonary tuberculosis, the public has a blind faith in the result of an *x*-ray picture of the chest in the diagnosis of this condition. The interpretation of those films (in which I am specially interested) is, I think, one of the most difficult and highly specialized branches of *x*-ray reading. Their practical value is great in persuading a patient with early symptoms to appreciate the need for strict treatment. I think the practitioner without more than a general knowledge is apt to be unduly impressed by signs of disease. He would sometimes take a more reasoned view if he had a film of his own chest as a standard. The value of this form of examination in ascertaining whether disease is sufficiently unilateral, in deciding the suitability of limiting expansion by artificial pneumothorax or phrenic avulsion, is now well recognized.

As regards the heart, during war service at Netley I was fortunate in having opportunity during spare time of screening chests in the *x*-ray room. At first, chiefly interested in lungs, I soon became more and more interested in screening the heart shadow, and became accustomed to screen all patients with heart symptoms in my wards. The value of the information derived from this addition to the usual methods of examination impressed itself more and more forcibly on me. There is a saying that "Every picture tells a story," and I think this is true of the *x*-ray picture of the heart. The variation in shape and size, the vertical and transverse limits, the general appearances of the shadow can, I think, add appreciably to the knowledge necessary in treating heart conditions. On attempting to put this method into practical use on returning to civil practice I was confronted with a difficulty that I had not foreseen. It is only when the method used is the same that results are comparable. I would press to-day the need for a fixed method of procedure in making these examinations. The upright position, the distance at which exposure is made, the clear definition of the mid-sternal line and the nipple point, when possible, are the most important points.

(*c*) *Abdomen.*—The bismuth meal raises a special problem. There is need for something more simple and less expensive than an elaborate and costly series of beautiful pictures where expense is so often an important consideration. In many cases a series of drawings from screening, with regional photographs, would be sufficient. The results of *x*-ray pictures of doubtful appendix cases is disappointing in my experience. How far can we rely on an *x*-ray of the gall-bladder or kidney in the case of suspected stone? Has the introduction of the use of dyes reached a degree of certainty in such cases?

Treatment

There are in my experience various conditions in which the general practitioner feels the need of this kind of treatment, but is often deterred by lack of knowledge of the likelihood of its success.

Exophthalmic Goitre.—I believe treatment by *x* rays of this group of diseases is carried out frequently. Personally, having seen one case where the result appeared to be most unsatisfactory, I have hesitated to advise it again. If there are cases which are suitable for this method of treatment, what are the conditions by which they can be distinguished?

Sterilization in the Female.—The general practitioner is keenly interested in the production of sterility in the female by *x* rays or radium. The most common type of case is where production of an artificial menopause or the quickening of the natural process is necessary for the welfare of the patient. I hope we shall hear to-day something definite on this point. The practitioner wants to be in a position to say to his patient that this form of treatment will entail (roughly speaking) so many visits to the radiologist and the approximate cost. I would emphasize at this point how much the practitioner needs to know the cost and time factors in all kinds of specialist treatments. A further important point in cases of this kind is how far we can assure or reassure our patients on the after-effects of such treatment.

Sterilization to Prevent Conception.—I am not one of those (and there are many in the profession) who view with alarm the state of the law in this country in this connexion. I have had cases, and I can envisage others, where I should not hesitate to advise and abet in obtaining security against conception by *x* rays or radium. It would be of interest to hear if radiologists view with disquiet the giving of treatment with this object on the request of a practitioner of experience and repute. One frequently hears in the ranks of both the profession and the public the opinion that the laws of this country need amending in relation to sterilization and the induction of abortion. I can only say in my professional experience I have never felt the need, nor have I felt handicapped in giving advice or treatment to this end.

Skin Treatment.—I imagine that practitioners as a class are fully alive to the success of radium and *x*-ray treatment of malignant disease of the skin and epithelium. Rodent ulcer, cancer of the lip and tongue, and of the cervix, are cases in point. But there are many conditions of the skin where the practitioner feels that *x*-ray treatment might be of value, but he is ignorant of its possibilities. Many dermatologists must be using this form of treatment in the more chronic skin eruptions. Why do we not hear more of the results and the conclusions at which they arrive? How far can we rely on such treatment, for example, for a speedy cure of multiple warts on the hands? Patches of psoriasis and the like

are also a frequent difficulty in general practice; we should often advise *x*-ray treatment if we knew more of its probable utility.

Carcinoma of the Breast.—This is a condition which has been only too familiar to the general practitioner from the days when the early use of the knife offered the only prospect of cure to the more efficient stage of post-operative *x*-ray treatment. The good results of this addition to our resources are widely appreciated, but, from the patient's point of view, the number of treatments needed, the cost, and loss of time involved, as well as the strain of a procedure that must ever remind the afflicted of the possibility of recurrence, are conditions which perhaps we are apt to appraise too lightly. Personally, the results that I have at present seen from the treatment of this condition by radium encourages me to hope that the knife will in time be displaced by radium and the need for subsequent *x*-ray exposure greatly lessened.

Conclusion

Though I am only too conscious of the disconnected sequence of my remarks, and of the many gaps in the subject, I hope that I have raised a sufficient number of points from the angle of view of the general practitioner to stimulate discussion in a useful direction. May I summarize my chief points as follows?

1. The lack of close co-operation between general practitioner and radiologist.
2. The difficulty the general practitioner experiences in keeping abreast with the advances in the development of your specialty.
3. The need for a closer co-operation within your ranks in order to harvest the experiences and the results at which you arrive.
4. The need for a more systematic presentation of these results to the general practitioner who seeks them, more particularly in post-graduate study.

A CONTRIBUTION TO THE COMPARATIVE STUDY OF THE TUBERCULIN TESTS IN INFANTS AND CHILDREN

BY

G. GREGORY KAYNE, M.D., M.R.C.P.

DOROTHY TEMPLE CROSS RESEARCH FELLOW IN TUBERCULOSIS,

AND

B. WEILL-HALLÉ, M.D.

MÉDECIN DE L'HÔPITAL DES ENFANTS-MALADES; DIRECTEUR DE L'ÉCOLE DE PUÉRICULTURE DE LA FACULTÉ DE MÉDECINE DE PARIS

A positive tuberculin test is now universally regarded as indicating tuberculous infection. The importance of the test in infancy and childhood is therefore threefold: (*a*) *in the diagnosis of tuberculous disease,* for the younger the child the more likely is a positive tuberculin test to be associated with an active tuberculous lesion; (*b*) *in dealing with home contacts,* for the test will indicate those already infected, a point of great importance when considering separation of a child from a tuberculous parent; and (*c*) *in connexion with B.C.G. vaccination,* as it is claimed that both the injection and the ingestion of this vaccine is followed after a varying interval, in a large proportion of cases, by a state of tuberculin hypersensitivity, even if all contact with tuberculous individuals is avoided—so that a positive tuberculin test will indicate that the period of isolation advisable after vaccination can be terminated, and it will also form a contraindication to revaccination.

It therefore seems essential that the various known tuberculin tests be compared not only as regards their relative sensitivity, but as regards the ease with which they can be employed in infants and children in practice; and, moreover, that there should be universal agreement as to what constitutes the minimum positive reaction for each test. Not only is the latter factor found to vary according to author, but one finds important and careful investigations reported in which no statement at all is made as to what the writers have considered a positive reaction.

Material of Investigation

The 166 infants and children tested were under the care of one of us (B. W.-H.) either at the Hôpital des Enfants-Malades, Paris, or the Fondation Zola, Médan, or in the wards of Professor Ombrédanne, surgeon to the Hôpital des Enfants-Malades. Their ages were as follows: under 1 year, seventy-two; 1 year, thirty-two; 2 to 4 years, sixteen; and 5 to 16 years, forty-six. As the chief importance of the tuberculin test is in children under the age of 2 years, it was considered preferable for the purpose of this investigation to divide the children into two groups: Group I (under 2 years), 104; and Group II (over 2 years), sixty-two. Ten children were diagnosed as suffering from, or suspected of, clinical tuberculosis. The classification of the two groups was as follows:

Group I:	Cervical adenitis. Arthritis of knee.
Group II:	Pulmonary tuberculosis (T.B. found). Pulmonary tuberculosis (no T.B. found). Tuberculous meningitis (no T.B. found). Tracheobronchial adenitis (no T.B. found). Cold abscess of rib. Pleurisy (T.B. found). Pleurisy (no T.B. found). Anal fistula.

The remaining 156 children may be considered as clinically non-tuberculous. In most of the children of Group II information as to whether they had been vaccinated with B.C.G. was not available. This was, however, known in ninety-six of the 104 children under 2 years, amongst whom twenty-nine had been vaccinated—seven less than six weeks, six between six weeks and three months, and sixteen over three months before the tests were performed.

Technique of Investigation

The tests were carried out over a period of two months on five consecutive series of children. All the tests (with the exception of the Pirquet tests in the first series of thirty-eight children, which were performed by B. W.-H.) were carried out, and all the reactions read and noted, by one of us (G. G. K.). The first series of thirty-eight children did not have a Moro test, otherwise the routine was the same.

The Pirquet, the Mantoux (1 in 1,000), and the Moro tests were performed at the same time. Two days later the test areas were inspected, and if all were found negative (or doubtful) the Mantoux test (1 in 100) was carried out. Two days later the test areas were again examined, and, if still negative, the Mantoux test (1 in 10) was performed, a control with broth being done at the same time. The tests were again read two and four days later, whatever the result.

The site of all the tests (even if positive) was thus inspected on alternate days for eight days (unless the patient had left the hospital), and (except in the case of the Moro test, where the type of response does not lend itself to these measurements) the reactions, *however slight,* were measured and palpated. Erythema was noted as "faint or marked," swelling as "slight, medium, or marked." Discoloration (blue, green, yellow) indicating bruising was also noted, as well as staining following erythema.

Technique of Individual Tests

Pirquet Test.—A drop of pure tuberculin (Pasteur Institute) was placed on the skin of the upper part of the right arm with the blunt end of a vaccinostyle.* A scarification about

* This is a metal instrument closely resembling a pen nib, commonly used for performing this test in France.

TABLE I.—*Moro Test. Positive and False Reactions*

A, area rubbed with ether only. B, area rubbed with ether and ointment. C, area rubbed with ointment only. First readings those taken two days after test.

GROUP I

Positive Reactions

1. Three macules at A, one papule at B; two days later, papule at B only present; six days later, papule desquamating.
2. Confluent papules over whole of both areas B and C, more marked at C; six days later, still present, but fainter.

False Reactions

1. Confluent papules over A and B, more marked at A; a few faint papules at C; two days later, papules at B more marked; four days later, all still present, but fainter.
2. Patchy erythema at A; two days later, erythemata over whole chest, most marked at A; four days later, *nil* to be seen.
3. Faint, blotchy erythema at A; two days later, *nil* to be seen.
4. A few papules on A and B.
5. A few small macules and faint erythema at A.

GROUP II

(No false reactions, but see No. 18 below)

Positive Reactions

1. One papule at B; still visible on sixth day.
2. Confluent papules over area 10 by 15 mm. at B; still visible on eighth day.
3. Bright erythema 3 by 4 mm. and a few small vesicles at B, 2 by 3 mm. bright erythema at C; lesion at B desquamating on eighth day.
4. Papules (nearly confluent) over whole of B, fewer and smaller papules at C; no definite change on eighth day.
5. Four papules at B; *nil* to be seen on fourth day.
6. A few faint macules at B; *nil* to be seen on fourth day.
7. Many small vesicles at B, four papules at C; no change on eighth day.
8. Three large vesicular papules at B, a few very small papules at C; no change on eighth day.
9. A few vesicular papules at B; no change on sixth day.
10. Several small papules at B and C, more marked at B; no change on sixth day.
11. Very small numerous papules at B and C, more marked at B; in addition, a few vesicles at B; no change on sixth day.
12. Four vesicular papules at B, three vesicular papules at C; no change on fourth day.
13. Many confluent papules at B, many papules at C; all fainter on eighth day.
14. One small papule at B, three small papules at C; no change on eighth day.
15. Many small papules (almost confluent) over whole of B and C; fainter on eighth day.
16. A few faint papules at B and C, more at B; fainter on sixth day.
17. A few small papules at B; patient not seen later.
18. A few very faint papules on one side of A; almost confluent papules over whole of B and C; much fainter on eighth day.
19. Many large papules (some vesicular) at B, a few papules at C; no change on fourth day.
20. Five papules (two of which large) at B; no change on sixth day.
21. Many papules (some large) at B, a few very small faint papules at C; no change on eighth day.
22. A few papules at B; no change on eighth day.
23. A large papule at B, a small papule at C; still visible on fourth day; *nil* to be seen on sixth day.
24. Several papules at B, a few faint small papules at C; no change on eighth day.

1 cm. in length was then made with the sharp end, first on the skin about 5 cm. above the tuberculin, and then through the drop of tuberculin. Bleeding was not always avoided. The arm was left exposed to the air as long as possible. A reaction was assumed to be positive when there was redness (or redness and swelling) at the sides of the lower scarification in the absence of these signs in the control. In one infant (not vaccinated with B.C.G. and from a non-tuberculous household) the lower scarification showed a linear erythema only, and this reaction was not considered positive, as the intradermal test up to 1 in 10 remained negative.

Moro Test.—Tuberculin ointment, consisting of two parts of tuberculin and one part of lanoline, freshly prepared, was employed. The lanoline was heated in a mortar on a water-bath to 50° C., and when it had liquefied the warmed tuberculin was added drop by drop. To obtain a uniform paste the mixture must be thoroughly stirred till cool. In about fifty children three similar squares, one below the other, and separated from each other by about 2 cm., were sketched out with a skin pencil on the middle of the chest—4 sq. cm. for the younger and 5 sq. cm. for the older children. Owing to the smallness of some of the chests the lowest square was often situated partly or wholly on the epigastrium. In the remaining children these squares were not mapped out, as it was found possible to gauge by eye the areas required. The skin in the upper two areas was rubbed across twelve times with a swab dipped in ether. The lowest of these two areas and the remaining "non-etherized" one were then rubbed for thirty seconds with a bead of the ointment. A separate finger was used for each of the two areas, and the time estimated by counting an equal number. In this way it was hoped to obtain at least some measure of uniformity between the test and the control, and the tests in the other children. The chest was left exposed to the air as long as possible.

A positive reaction was considered to be the presence of one or more definite macules, papules, or vesicles in the middle, lower, or the middle and lower areas, in the absence of any reaction on the upper area, or when the reaction in the lower areas was considerably greater than in the upper area. In Table I are summarized the Moro tests which showed any reaction at all at any of the areas. Particular care was taken not to mistake papules and rashes commonly found on the chest for reactions due to the rubbing of the ether or ointment.

Mantoux Test.—Each dilution was freshly prepared for the day of the test from pure tuberculin (Pasteur Institute) with sterile distilled water and 0.5 per cent. phenol: 0.1 c.cm. was injected each time, a glass hypodermic syringe and intradermal needles being used for the first series of thirty-eight children, the former being replaced by a Pictet intradermal syringe later. With the latter syringe 0.1 c.cm. of the solution is ejected as the result of performing a complete turn of, instead of pushing, the piston, and this considerably facilitates the injection. [See description of syringe (G. G. K., *Lancet*: In the press).] The test with the 1 in 1,000 dilution was performed on the right, with the 1 in 100 dilution on the left, forearm, and with 1 in 10 dilution lower down on the right forearm, when 0.1 c.cm. of the control was injected at the same time on the lower part of the left forearm. For the latter the same glycerin-veal broth employed for the preparation of the tuberculin was obtained from the Pasteur Institute. In the first thirty-eight children it was used unaltered, but for the others the broth was evaporated down and then diluted ten times with distilled water with 0.5 per cent. phenol. In the first thirty-eight children an ordinary hypodermic syringe was employed for the tuberculin 1 in 10 and the control; in the next fifty the Pictet syringe for the 1 in 10 tuberculin and an ordinary syringe for the control. In the remainder a Pictet syringe was used for both. In order to discount any difference in reaction as a result of the different type of syringe the 1 in 1,000 and the 1 in 100 tests in twenty-two children were carried out with each syringe at the same time. No appreciable difference in traumatic or minimal reactions (see below) were noted. Moreover (see Table IV), the percentage of total traumatic reactions with both syringes is the same.

A positive reaction for any of the intradermal tests was constituted by an erythema of at least 10 mm. in diameter, showing slight swelling or a definite erythema over 10 mm. in diameter.* Erythemata 5 mm. in diameter to the above limit were considered as doubtful reactions and the test repeated with the next stronger dilution. Doubtful reactions with the dilution of 1 in 10 gave rise to difficulty in interpretation (see Table II and footnote [11]).

Results

(A) RELATIVE SENSITIVITY

Table II indicates the results obtained with these tests.

Comparison of the Moro test with the other two tests in the younger group is difficult owing to: (1) the fact that thirty-eight children were not tested, (2) the relatively small number of positive tuberculin tests, and (3) the occurrence of false reactions (see above). The Pirquet

* Evidence for the need of assuming this as the minimum positive reaction has already been brought forward by one of us (G. G. K., *Lancet*: In the press).

and Mantoux (1 in 1,000) tests appear equally sensitive, the Mantoux (1 in 100) more so, and no further positive reactions were obtained with the dilution 1 in 10. Roughly, the number of positive reactions per 100 children under 2 years with the Pirquet test and Mantoux test, in the three increasingly strong dilutions, are 4, 4, 6, 6. In the older group comparison of the three tests is possible, as there were no reactions with the ether, and the number of positive tests is much greater. The number of positive reactions per 100 children, aged 2 to 16 years, for the three tests were therefore: Moro, 42 to 39 (see footnotes [4] and [5] in Table II); Pirquet, 48, and Mantoux (in the three increasingly strong dilutions), 50 (see footnote [6]), 55 (see footnotes [8], [9], and [10]), 61 to 55 (see footnotes [11], [12], and [13]).

To summarize, it may be stated that the Moro test is the least sensitive of the three tuberculin tests, the Pirquet and the Mantoux (1 in 1,000) about equally sensitive (in favour of the latter), the Mantoux (1 in 100 and 1 in 10) increasingly more sensitive than the last two. It is interesting to note that while in children under 2 years the Mantoux (1 in 100) increases the number of positive reactions by 50 per cent. on the Pirquet, it is only two more children in a 100 that are found positive. In the older group the number of positive reactions is increased by 13 per cent. only, but six to seven more children per 100 tested are found positive. Thus in testing infants the chances of finding a positive reaction with the Mantoux test when the Pirquet is negative are very much smaller.

Finally, it should be noted that all the diagnosed or suspected cases of clinical tuberculosis were found to be Pirquet-positive and Mantoux-positive (1 in 1,000), but that two of these patients were negative to the Moro test: (*a*) pulmonary tuberculosis (T.B. found), and (*b*) tracheobronchial adenitis (no T.B. found).

(B) Technical Advantages and Disadvantages in Practice

The Pirquet test is undoubtedly the simplest to perform: the material is always at hand, the vaccinostyle looks like a nib and does not frighten the child, and the test can be carried out most rapidly. Certain precautions must, however, be taken. Thus: (1) so far as possible bleeding should be avoided, as this may prevent contact of the tuberculin with the dermis; (2) the control scarification should be made above and not below the tuberculin, as otherwise the latter may run down on to the control area; (3) the lower scarification should be done *through* the tuberculin and the tuberculin not be deposited on it afterwards; (4) the tuberculin should be left exposed to the air for at least a few minutes, after which it may be gently wiped off (a dressing should not be applied, as the latter magnifies the importance of the operation in the eyes of the parents); (5) it is suggested that whenever possible the test be carried out by the medical man himself.

The reputed claim of the simplicity of the Moro test cannot be maintained. Thus: (1) if Table I is referred to it will be seen that out of the twenty-six positive tests in nine the area rubbed with tuberculin only gave no reaction, and in thirteen more the reaction was less marked in the area which had previously not been rubbed with ether, the preliminary cleansing of the skin with ether thus appearing to be essential; (2) the rubbing of the skin with ether gives rise in the young children (for whom the simplification of a tuberculin test is particularly desirable) to false reactions (see Table I), presumably due to their more tender skin: hence, it is essential that a control area rubbed with ether only should form part of the test; (3) the older children in this investigation strongly objected to the smell of the ether, the rubbing with ether proving, in fact, to be the most trying part of all the procedures, and, presumably, is very disagreeable to infants who cannot voice their protests; (4) rubbing two areas with ether and then one with ointment renders the operation a more prolonged one than either the Pirquet or the Mantoux test; (5) the test is messier than either of the other two, as the grease does not dry; (6) a positive reaction often results in a group of papules covering an area as much as 7 cm. in diameter, and this is more objectionable to the parents than the single erythematous patch of a positive Pirquet or even Mantoux test; and (7) it is advisable to have the ointment freshly prepared.

The Mantoux test has the following disadvantages. (1) The dilutions must be fairly freshly prepared (not more than two weeks old); (2) the test is more of an operation in the eyes of children and parents, as something is injected and the apparatus is more complicated; (3) it is more painful. Even if the needle is small and sharp, pain is

TABLE II.—*Relative Sensitivity of the Three Tuberculin Reactions.*

Age	Pirquet			Moro				Mantoux											
								1 in 1,000				1 in 100				1 in 10			
	No. Tested	Positive		No. Tested	Positive		% Positive of Whole Series	No. Tested	Positive		% Positive of Whole Series	No. Tested	Positive		% Positive of Whole Series	No. Tested	Positive		% Positive of Whole Series
		No.	%		No.	%			No.	%			No.	%			No.	%	
Under 2 years	104[1]	4	3.8					104	4	3.8	3.8	95	2	2.1	5.8	87	0	0	5.8
	66[2]	3	4.5	66	2[3]	3.0													
2 to 16 years	62	30	48.3	60	24	40.0	41.9[4]–38.7[5]	61	30	49.1	50.0[6]–48.2[7]	22	2	9.0					
													3[8]	13.0[8]	54.8[9]–53.2[10]	19	4–1[11]	21.0—5.2	61.1[12]–54.8[13]

[1] In one child the test gave a linear erythema; this was not considered positive, as the Mantoux test up to a dilution of 1 in 10 remained negative.
[2] Excluding thirty-eight cases in which the Moro test was not performed.
[3] One of these reactions was very feeble (see Table I).
[4] Assuming that the two patients not tested (one was in a plaster jacket and the other had a rash on the chest) would both have reacted positively.
[5] Assuming that these two patients would both have reacted negatively.
[6] Assuming that the patient not tested (supply of tuberculin ran out) would have reacted positively; almost certainly so as the Pirquet reaction was positive.
[7] Assuming that this patient would have reacted negatively.
[8] Adjusted on the assumption that the nine patients not tested (left hospital) would have reacted in the same proportion as those who did.
[9] [10] Dependent on [6] and [7].
[11] In only one of these was the test definitely positive by the criteria adopted; in the others it was doubtful; thus the reactions were: (*a*) 15 by 22 mm. ill-defined erythema (control negative), patient not seen on fourth day; (*b*) 12 by 15 mm. ill-defined erythema (control negative), negative on fourth day; (*c*) 6 by 6 mm. faint erythema and slight swelling (control negative), patient not seen on fourth day.
[12] Assuming all four reactions with 1 in 10 dilution and the one not tested with 1 in 1,000 were positive.
[13] Assuming only one of the four reactions with 1 in 10 was positive and the one not tested with 1 in 1,000 was negative.

TABLE III.—*Mantoux Test. Doubtful and Minimal Reactions.*

Age	1 in 1,000						1 in 100						1 in 10					
	No. Tested	No. Positive	Minimal Reactions		Doubtful Reactions		No. Tested	No. Positive	Minimal Reactions		Doubtful Reactions		No. Tested	No. Positive	Minimal Reactions		Doubtful Reactions	
			No.	%	No.	%			No.	%	No.	%			No.	%	No.	%
Under 2 years	104	4	29 (24)	*27.8*	3 (3)	*2.8*	95	2	38 (32)	*40.0*	7 (7)	*7.1*	87	0	54 (43)	*62.0*	4 (3)	*4.5*
2 to 15 years	61	30	9[1] (7)	*14.7*	2 (1)	*3.2*	22	2	8[2] (6)	*36.3*	1 (1)	*4.5*	19	4—1[3]	7 (6)	*36.8*	1-4[3] (0)	*5.2–21.0*

[1] One of these became positive with dilution 1 in 100; another showed a slight stain only till eighth day, when there developed a faint erythema 10 mm. in diameter (negative with dilution 1 in 100).

[2] One of these became positive with dilution of 1 in 10.

[3] See footnote [11] in Table II.

Numbers in parentheses represent reactions visible or showing staining at least on fourth day after performance of test.

caused by the distension during the injection (in infants considerable force is often required to eject even 0.1 c.cm. from the ordinary hypodermic syringe); (4) if the test is negative with 1 in 1,000 dilution the parents are more likely to object to the repetition of an apparently exactly similar operation.

The test is considerably simplified, however, by the use of a Pictet intradermic syringe (see above).

(C) MINIMUM POSITIVE REACTIONS

Pirquet Test.—A reaction should be regarded as positive if there is at least 1 mm. of erythema on each side of the lower scarification, in the absence of such change in the upper one. A linear erythema should not be regarded as positive, and it is advisable in such cases to carry out the Mantoux test (1 in 100). It should be noted that six of the thirty-four positive Pirquet tests were more marked on the fourth day after the test.

Moro Test.—The presence of even one definite large papule on the area rubbed with the ointment, in the absence of any change on the area rubbed with ether only and of papules or a rash on the neighbouring skin, may be regarded as a positive reaction. However, owing to the frequency of the latter on many chests, it is advisable, when only one or two papules are present, or any doubt is felt, to perform a confirmatory test with the Pirquet or the Mantoux (1 in 1,000). An area of erythema only should not be regarded as a positive reaction.

Mantoux Test.—An area of erythema 10 mm. in diameter, showing some swelling to touch, or a well-defined erythema of greater diameter, should be regarded as the minimum required for a positive reaction. Erythemata 5 mm. in diameter up to the above measurement should be regarded as doubtful reactions, and the test performed with the next stronger dilution. Table III gives the number of these doubtful reactions with each dilution in each group. Only two out of a total of thirteen (1 in 1,000 and 1 in 100 dilutions only) were positive with the next stronger dilution. One of the positive reactions with 1 in 1,000 and one of the positives with 1 in 100 were doubtful two days after the test, but became positive on the fourth day.* It is therefore advisable, when a doubtful reaction is obtained, to postpone carrying out the test with the next stronger solution until the test has been reinspected on the fourth day.

Table IV gives the number of obviously traumatic reactions as shown by blue, green, or yellow colouring of bruising. It is of interest to note that the percentage is the same for both groups of children and whether an ordinary hypodermic or Pictet syringe is used.

* It should also be noted that five of the thirty-four positive reactions with 1 in 1,000, one of the four positives with 1 in 100, and the definitely positive reaction with 1 in 10 were more marked on the fourth day after the test.

Table III gives the number of minimal reactions noted—that is, all reactions showing erythema, or erythema and swelling, less than 5 mm. in diameter. It will be noted that their percentage increases with each dilution, particularly in the younger group. It must be emphasized that 118 out of 145 (80 per cent.) of even these reactions show some staining at least on the fourth day after test. The need for the use of a control test (as described) when the Mantoux test with the dilution 1 in 10 is employed is obvious, especially if the test is stopped at this dilution. The 145 control injections gave rise to eight reactions showing bruising, sixty-three (43 per cent.) minimal reactions, eight reactions corresponding to those described as "doubtful" (seven still visible on the fourth day), and four reactions (two visible on the fourth day)

TABLE IV.—*Mantoux Test. Reactions Indicating Bruising.*

Age	1 in 1,000			1 in 100			1 in 10		
	No. Tested	No. Showing Bruising	%	No. Tested	No. Showing Bruising	%	No. Tested	No. Showing Bruising	%
Under 2 years	104	8	*7.6*	95	10	*10.5*	87	6	*6.6*
2 to 16 years	61	3	*4.9*	22	3	*13.6*	19	3	*15.7*

All Dilutions

Age	No. of Tests	No. Showing Bruising	%	Group I Only	No. of Tests	No. Showing Bruising	%
Under 2 years	286	24	*8.3*	Ordinary syringe	107	9	*8.4*
2 to 16 years	102	9	*8.8*	Pictet syringe	179	15	*8.3*

measuring 10 mm. in diameter or more. Eleven of these last twelve reactions occurred in the children under 2 years. As, from what has already been stated, these minimal and doubtful reactions cannot be attributed to the trauma of the injection or to the type of syringe used, one is tempted to suggest that they are due to the irritation of some substance* in the broth in which the tuberculin is prepared, and that the infant's skin is particularly sensitive to it.

(D) THE B.C.G. VACCINATED CHILDREN†

While admitting that the smallness of the numbers renders conclusions impossible, it is nevertheless of interest

* This is left intentionally vague. Further work on this question is now being carried out by one of us (G. G. K.).

† The results under this heading appear contradictory with those obtained by one of us in papers previously published. Account should therefore be taken of the small number of vaccinated children here tested.—B. W.-H.

to point out that of the twenty-two infants who had been vaccinated with B.C.G. over six weeks before (sixteen over three months before)—all by mouth except two, four a second time since birth—only two were positive to a tuberculin test. Thus:

(*a*) Vaccinated subcutaneously nine weeks before test. Had been in contact with sputum-positive mother for a few days before admission. Negative Pirquet; positive to Mantoux (1 in 100).

(*b*) Vaccinated at birth by mouth seventeen months before test. Had been in contact for eleven months with a father who coughs, but whose examinations were stated to be negative as regards tuberculosis. Positive Pirquet and Mantoux (1 in 1,000).

Conclusions

In spite of the relatively small number of children here investigated we feel justified in drawing the following conclusions:

1. The Moro test is the least sensitive of the three tuberculin tests commonly employed. The Pirquet (pure tuberculin) and the Mantoux test (1 in 1,000) are about equally sensitive, the Mantoux (1 in 100) being definitely more sensitive.

2. For use in infants and young children the Moro test* has definite disadvantages as regards technique and interpretation of results. When employed, a control test with ether only should always be carried out.

3. The Pirquet test is, for infants and young children, the simplest and easiest test to perform, and should therefore be employed first. If found to be negative, an intradermal test with a dilution of 1 in 100 should then be carried out. In older children it is worth while to repeat the test, if still negative, with a dilution of 1 in 10.

4. The Mantoux test in a dilution of 1 in 10 should always be carried out with a control injection of the broth used for the preparation of tuberculin.

5. A Pirquet test should be regarded as positive only if there is at least 1 mm. of erythema on each side of the scarified area.

6. The minimum required for a positive Mantoux test with any dilution is an area of erythema 10 mm. in diameter, associated with some swelling to touch, or a well-defined erythema greater in area than this. Reactions showing an erythema 5 mm. in diameter or more should be regarded as doubtful, reinspected on the fourth day, and, if still doubtful or negative, the test should be repeated with a stronger dilution. If a reaction obtained with a dilution of 1 in 10 is on the fourth day definitely more marked than the control test, but still under the limit of a positive reaction as indicated above, it is advisable to regard the test as doubtful, and repeat it either within ten days or in three months' time.[1]

7. It is suggested that instead of maintaining the controversy as to the relative value of the Pirquet and Mantoux tests, the test indicated here (Pirquet followed by Mantoux 1 in 100), combining both, should be adopted as a routine under a different name—for example, "the combined tuberculin test," or "the cutaneous intradermal test."

We should like to express our thanks to Professor Ombrédanne for allowing us to test the patients under his care, to Dr. Guérin, of the Pasteur Institute, for supplying the broth used for the control test, and to the ward sisters for their help during the course of the investigation.

REFERENCE

[1] Hart, P. D'A.: Medical Research Council Special Report No. 164, 1932.

* The tuberculin ointment now prepared by Löwenstein and sold in small tin tubes as "dermotubin" contains only 40 per cent. tuberculin and is recommended to be used on the arm, back, chest, abdomen, or front of leg, after preliminary cleansing with benzene, ether, alcohol, or soap and water.

CHLOROFORM-HYOSCINE AMNESIA IN LABOUR

BY

JAMES CLARK, M.B., CH.B.ED.

In the *British Medical Journal* of May 26th, 1934, there is an admirable article on hyoscine amnesia in labour by Mr. Trevor Barnett. It stresses the value of hyoscine alone in producing an amnesia which is preferable to hyoscine-morphine narcosis. Mr. Barnett has verified that the use of hyoscine without the initial injection of morphine eliminates the oligopnoea of the newborn infant. In his conclusions he stresses three conditions which make it impossible for the general practitioner to employ the method he advocates. These are:

1. The need for constant supervision during labour.
2. Occasional necessity for two nurses to control the patient.
3. That the method cannot be employed unless one is assured of the presence of the possibly necessary skilled attendants. (These, perhaps, meaning a qualified medical assistant and two nurses.)

This valuable method, then, can only be utilized in a nursing home where such skilled staff is provided.

It is my intention to try to show that a modification of the hyoscine method has proved to be of great value as a domiciliary measure. During the last ten years in general practice I have conducted eighty-four confinements on the lines about to be described. The usual antenatal examination and care are observed, and the cases selected are those which one, as a general practitioner, would select for home treatment.

Details of Procedure

Treatment is commenced when the patient complains of pains which are regular and of moderate strength. The strength and duration of pains are best gauged by abdominal palpation. I have not found that any arbitrary division between first and second stages of labour assists one's judgement. The nervous constitution of the patient and the consequent degree of fear and sensitiveness to pain are more important. As the practitioner's efforts are directed towards saving the patient from any avoidable suffering, it is better to institute the treatment too early rather than let the pains assume too severe a character. Erring on the early side does not seem to protract the labour. After all, one is dealing with a psychosomatic process and not with a stereotyped mechanism which must conform to an average standard set by textbooks.

The patient is put to bed. One nurse is in attendance. An initial light anaesthesia is induced by chloroform until the patient is quiet and sleeping between pains. (It is the experience of most general practitioners that women in labour take chloroform very well.) A hypodermic injection of hyoscine (1/100 grain) is given immediately the patient is lightly under. The hyoscine is repeated in doses of half this amount at intervals varying from half an hour to an hour. The ideal to be aimed at is that the patient should be definitely drowsy and quiet between pains. During pains discomfort is evidenced merely by subdued groans and slight restlessness. Any indication of returning awareness can be controlled by immediate inhalations of chloroform and a subsequent injection of hyoscine. This use of chloroform as an intermediary often makes all the difference between a perfect amnesia and one in which a severe pain is recalled with extraordinary intensity.

One also finds that chloroform controls any restlessness which hyoscine may produce. This, however, is rarely

necessary, as the initial administration of chloroform seems to have a subduing effect throughout. The quiet nature of a confinement conducted in this manner is such that the assistance of only one nurse is ample. After experience of the method, one learns to judge for how long during labour the patient may be left in sole charge of the nurse. She receives instructions within the discretion of the medical attendant as to the times of the next one or two injections of hyoscine. As labour progresses the dose of hyoscine is diminished to 1/300 or 1/400 grain, and the intervals of injection lengthened or shortened according to the judgement of the practitioner. I always avoid giving any hyoscine during the hour immediately preceding delivery, and administer light chloroform from the time that the anus assumes the D shape until the head is born. Should labour be delayed, as it may be in any confinement, pituitrin may be used as in ordinary cases, with certain efficiency. Ordinary everyday stimuli should not affect the patient. By these are meant daylight or artificial light, sounds of outdoor traffic, sounds of quiet voices, and of walking in the room. There is no need, therefore, to darken the room, stuff the patient's ears with cotton-wool, or preserve in the house the silence appropriate to a death-chamber.

In no case does the amnesia seem to affect the condition of the infant at birth. The delivery of the placenta is often delayed, but not unduly so ; in this one respect more patience is required than in the ordinary confinement.

Maternal loss and after-recovery remain unaffected. The mother sleeps or remains drowsy for some time. Anyway, the amnesia lasts beyond delivery for a period which is directly proportionate to the extent of the amnesia induced during labour. The mother usually emerges from her amnesia with a strongly expressed disbelief that her baby has arrived.

Advantages of Method

This method is particularly valuable in general practice for the following reasons:

1. Primiparae prefer to be confined at home ; the first baby is an event, and the medical attendant is expected to get the patient out of her pain as soon as possible.

2. Multiparae who have previously had protracted or exhausting labours do reasonably demand that they should not " have to go through the same again."

3. It reduces the number of instrumental labours. The practitioner is relieved of the exhortations of the patient and her relatives to " get her out of her suffering soon."

It was in such a case that the writer developed the chloroform-hyoscine technique. A young primipara was sufficiently advanced in labour as to justify vaginal examination. This she subconsciously resisted. All that could be ascertained was that the head *might* be on the perineum. The patient and her relatives demanded early relief. Chloroform was administered with a view to applying Milne-Murray forceps. Under light anaesthesia it was found that though the os was paper thin, the head was not entirely on the perineum. Hyoscine (1/200 grain) was given immediately and two injections each of 1/400 grain at half-hourly intervals. (Morphine was avoided on account of the advanced stage of labour.) A further administration of chloroform was given on the first appearance of the head, which was born under control two hours after the first light chloroform was given. Three hours after delivery the patient was asleep, the amnesia having continued until she was in a natural sleep of fatigue.

4. It enables the general practitioner to enhance his reputation or to establish it. Here is something that clinics do not do, something that general nursing-homes might, but as a rule do not, countenance ; yet something that still maintains the status of a medical man as *the family doctor.*

Clinical Memoranda

CARCINOMA VENTRICULI IN A WOMAN OF 90

In view of the extreme age of the patient and the scarcity of recorded cases of stomach cancers in old people, I think the following case worthy of record.

Mrs. A., aged 90, was admitted to the City Hospital, Plymouth, on May 30th, 1934, complaining that for the previous ten days she had had constant retching and vomiting, and had been " unable to keep anything down." The bowels had not been open for the last three days, but there was no history of previous ill-health. On admission the patient was obviously practically moribund and very wasted and cachectic, and there was also cyanosis of the lips and slight oedema of the ankles.

Abdominal examination revealed a hard, freely movable mass, with well-defined margins, situated in the mid-line just below the umbilicus. The mass was about 2 inches by 3/4 inch, and was dull to percussion. Examination of the heart and pulse showed that well-marked auricular fibrillation was present. A probable diagnosis of carcinoma of the transverse colon was made, but the patient was too ill for operation to be contemplated, and she died on June 1st.

At the necropsy it was found that the mass was due to a hard, sclerosing growth of an annular type involving the pyloric end of the stomach ; the edges of the growth were extremely ill defined: there was no visible ulceration of the gastric mucosa, and a few hard glands were seen lying in the lesser omentum close to the growth. No visceral deposits were present apart from the primary growth. Microscopical section of the mass demonstrated the growth to be a typical columnar-celled carcinoma. There was extreme gastric dilatation above the growth, proving that almost complete obstruction had occurred. The heart showed extreme fatty degeneration.

COMMENTARY

The literature concerning cancer in the aged is very scanty, and no case of cancer of the stomach in a patient of this age has, I believe, been reported in recent years. According to Osler the ages at which cancer of the stomach occurred in 150 cases at the Johns Hopkins Hospital were:

Age	Cases	Age	Cases
20–30	6	50–60	49
30–40	17	60–70	36
40–50	38	70–80	4

In the *American Journal of Cancer* (February, 1934, xx, 477) Shore reports that in Finsterer's series of resections of the stomach for carcinoma, one-third of the patients were between the ages of 60 and 83. Finsterer found age *per se* no contraindication to operation ; in fact, while the immediate mortality in the group (60–83) was 9.5 per cent., compared with 6 per cent. in the younger patients, the percentage of five-year cures was 40 in the aged, compared with 22 in the under 60 class, showing that carcinoma of the stomach in the aged is a relatively benign condition.

It is well known that cancer of the stomach can advance to the inoperable stage without giving much evidence of its presence, and in this case, though a growth was found post mortem which must, by its size, have been present for several months, no symptoms were complained of until a few days before the patient's death from pyloric obstruction.

It is, of course, possible that carcinoma of the internal organs in the aged occurs more often than is supposed, and that the diagnosis is seldom made owing to the rarity with which post-mortems are performed in such patients, and the difficulty in getting histories from persons of advanced years.

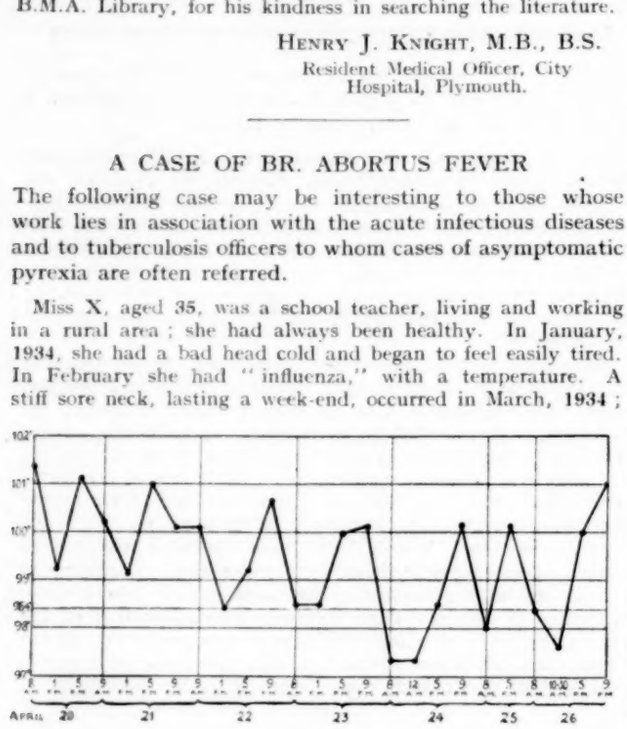
My thanks are due to the medical superintendent of the City Hospital, Mr. G. E. Larks, F.R.C.S., for permission to record this case, and to Mr. T. J. Shields, Librarian of the B.M.A. Library, for his kindness in searching the literature.

HENRY J. KNIGHT, M.B., B.S.
Resident Medical Officer, City Hospital, Plymouth.

A CASE OF BR. ABORTUS FEVER

The following case may be interesting to those whose work lies in association with the acute infectious diseases and to tuberculosis officers to whom cases of asymptomatic pyrexia are often referred.

Miss X, aged 35, was a school teacher, living and working in a rural area; she had always been healthy. In January, 1934, she had a bad head cold and began to feel easily tired. In February she had "influenza," with a temperature. A stiff sore neck, lasting a week-end, occurred in March, 1934; she felt seedy, and her work was an effort to her. By lunch-time she wished it were bedtime. This post-meridian fatigue became so marked that she decided to go on holiday to North Berwick. There, during Easter, she developed a head cold, and first noted that she had a peristent temperature. Soon troublesome profuse and diffuse sweating also began to trouble her, this sweating taking place in the early evening and during the night. A tentative diagnosis of tuberculosis having been made, the patient was seen by me in the capacity of tuberculosis officer on April 27th, 1934. Her only complaint was her "temperature" and the drenching sweats. There was no headache, backache, pains in joints, and no cough. Slight constipation was present, but the appetite was fairly good. The patient looked alert. The skin was velvety and clammy, and there was no loss of subcutaneous fat. Pulse rate 96, soft, compressible, and of full volume. There was no acrocyanosis. Tongue dry and somewhat furred on the dorsum, clean at the tip and edges. There were no abnormal physical signs in heart, lungs, or abdomen, and taking into consideration the fact that, despite the high temperatures, there were no evidences of toxaemia, a diagnosis of miliary tuberculosis was thought unlikely. A provisional diagnosis of *Br. abortus* fever was made on the findings of high temperature, post-meridian fatigue, and profuse sweating, combined with the absence of localizing signs and toxaemia. On May 1st an agglutination test was performed. This gave a positive agglutination with *Br. abortus* of Bang to a titre of 1 in 5,000.



The appended day temperature charts (compiled by relatives, and therefore lacking in technical precision) show the interesting comparison between temperature, fatigue, and sweating.

Glasgow. S. HARVEY, M.B., CH.B., D.P.H.

AUTOTRANSFUSION IN GRAVE EMERGENCY

The following case seems to illustrate the value of autotransfusion in certain urgent circumstances. It is therefore placed on record.

R. S., a motor lorry driver, was admitted on August 2nd to the King Edward Avenue Hospital, Dartford, with a history of "a violent fall off his lorry on to the mudguard, severely injuring his left ribs." On examination the radial pulse was almost impalpable at 150 beats per minute, temperature 96° F., and extreme pallor obvious. The patient was collapsed, but felt tenderness and pain on pressure over lower left ribs and left side of the abdomen. The abdomen was rigid, distended, and dull on percussion from the costal margin to the left flank almost to the mid-line—definite indication of a ruptured spleen with intraperitoneal haemorrhage.

Using open ether as an anaesthetic, the spleen was isolated, the pedicle being ligatured, and, with the splenic vessels, removed. It was grossly lacerated, and ruptured completely through to the pedicle at the lower two-fifths, the peritoneal cavity being distended with blood. The escaping blood and the free blood in the peritoneal cavity were collected to the amount of 600 c.cm., strained through sterile muslin, citrated, and returned into the circulation through the median basilic vein. Only clots were removed from the peritoneal cavity, the residue of blood with serum being deliberately left in the peritoneal cavity along with normal saline. As the autotransfusion proceeded pulse and colour gradually improved, and the patient was returned to the ward in a very much better condition than when he left it. Continuous subcutaneous saline was administered (rectal was not possible), and 1/6 grain morphine given. Apart from three slight rigors without any rise of temperature thirty-six hours after operation, recovery was uninterrupted, and the patient, after ten days, felt perfectly fit. I ascribe the success of this case largely to the autotransfusion suggested and promptly carried out with exact technique by Dr. A. N. F. Critchley, house-surgeon.

COMMENT

This hospital has a satisfactory transfusion service, with donors available with reasonable promptness, but at its best this accessibility is not comparable with that of autotransfusion, as in this case. Further, such blood must be definitely superior for transfusion to blood from the best of donors (correct group or universal), none of which can be guaranteed to be 100 per cent. free from the risk of an anaphylaxis in some degree. It would be interesting to know from those with wide experience of blood transfusion how far the field of autotransfusion has been explored and made use of. Excluding blood from infected parts, or blood containing extraneous material, such as the contents of ruptured liver cells or bile ducts, it would seem that where the patient's own germ-free blood could be carefully collected it would prove of great service for autotransfusion in cases with danger of fatal shock through haemorrhage—for example, ectopics, ante-partum and post-partum haemorrhages, and operation cases in grave injuries with haemorrhage before and during operation.

M. W. RENTON,
Consulting Surgeon to King Edward's Avenue Hospital, Dartford.

Reviews

MEDICAL BEHAVIOUR

An extremely wise book is *The Doctor and his Patients*,[1] a collection of papers by Dr. ALBERT KRECKE of Munich, translated from the second German edition by Margaret M. Green. There are twenty-three articles, all of them relatively short, and every one of them worth while. They deal with the relations of medical practitioners with one another and with their patients, most of them written from the point of view of an experienced surgeon for the benefit of the young general practitioner. They are full of understanding both of the mental attitude of patients towards their maladies and of the difficulties of the young doctor, whether family doctor or junior specialist, in the daily conduct of his work. There is naturally some repetition, and the book should not be read straight through, but there is not a chapter which may not be read and reread with profit. Most of the articles may, indeed, be described as almost models of what the inexperienced practitioner would wish to be told, and of the way in which a senior member of the profession may best pass on the results of the experience which he has gathered to those who stand in need of it. Every operating surgeon of many years' standing must be well aware of the doubts and difficulties arising from the circumstances of his practice and the decisions with the making of which he is confronted ; but not every surgeon has so clear and constant an appreciation of the psychological reaction of the patient. Papers on " How Do Patients Picture the Nature of their Malady?" on " The Prevention of Pain," and on " The Fear of Cancer," illustrate the value of such an appreciation.

Chapters of a different character are indicated by the titles " Mania Operatoria," " Operations in Patients of an Advanced Age," " The Visual Examination of Patients," and " Washing the Hands." A still further variety of questions is dealt with in those headed " The Hospital Doctor and the General Practitioner," " Collusion between Doctors," " Something Went Wrong " ; and yet another under such captions as " The Doctor's Woman Assistant," " How the Doctor should Read his Weekly Journal," " The Doctor When Ill," and " Payment by One Doctor to Another." These subjects do not exhaust the contents of the book, but they indicate the wide range of kindred matter with which it is concerned. The author modestly says: " If I discuss a question concerning the mental attitude of patients it is only a matter of several perfectly innocent observations which any doctor who does not regard his profession merely as a trade might make any day " ; and again, " We are not taught these little things enough in our student days. We have to learn slowly in our practice the many means by which patients can be spared mental strain " ; and " A man must have reached a certain age in order to perceive that surgery is not the universal remedy for which we are often apt to take it in our youthful enthusiasm." All sorts of wisdom for the guidance of daily practice, and for the cultivation of correct judgement in emergencies will be found within the covers of this book, and just now, when the ethics and etiquette of consultation are under consideration, it might be well for all concerned to read Dr. Krecke's paper on " Is it Justifiable to Advise and Treat other Doctors' Patients?"

It was judicious to place the short biography and appreciation of the author at the end of the book rather than at the beginning, for no one can read a group of articles like these without a desire to know who was the skilled surgeon, the untiring worker, the sympathetic friend, the wise counsellor, who penned them. The conditions in which he worked and for which he wrote are German, and it is clear from several passages that the economic stress of the medical profession in Germany, and the effects of the insurance system, are less favourable than in this country, but the character of the problems, both scientific and ethical, with which a practitioner is confronted are almost startlingly similar in that country and here. The book is valuable and the translation well done.

[1] *The Doctor and His Patients.* By Albert Krecke, M.D. Translated from the second German edition of 1932 by Margaret M. Green. London: Kegan Paul and Co., Ltd. 1934. (Pp. 301. 10s. 6d. net.)

SYPHILIS

A full account of Experimental Syphilis,[2] from the earlier days in the last century, when human beings were employed for the purpose, down to modern times, when animals of many kinds—chimpanzees, catarrhines, rabbits, guinea-pigs, rats, and mice—have been much employed, is given by GASTINEL and PULVENIS. The subject is discussed from many points of view, and there are chapters given to such matters as the ways in which the infection becomes generalized, the factors that may modify its results, the curious " asymptomatic syphilis " that may be seen in rabbits or mice, the occurrence and nature of immunity to syphilis in both human beings and experimental animals, and observations on Meinecke's reaction in experimentally infected rabbits. The book is well written, and contains a deal of information ; it should be in the hands of laboratory workers.

Dr. RAVAUT's essay on a New Form of Syphilis of the Nervous System[3] deals with the detection of syphilis by the changes it produces in the cerebro-spinal fluid in the days before there is any clinical evidence to show that the central nervous system has become infected ; he describes it as a biological form of neurosyphilis, which can be detected only by examining the fluid yielded by lumbar puncture, and no doubt it is comparable to the asymptomatic experimental syphilis of Gastinel and Pulvenis mentioned above. The importance of the diagnosis and treatment of neurosyphilis at the earliest possible moment need not be stressed ; Dr. Ravaut deals with the whole subject clearly and at length, in all its different aspects. The book should be read by all medical practitioners interested in the early diagnosis and treatment of syphilis of the nervous system.

A good general account of the methods nowadays employed in the treatment of neurosyphilis in the Vienna clinics is given by Dr. DATTNER in his volume on the Modern Therapy of Neurosyphilis.[4] Professor Wagner-Jauregg has furnished the preface, and as is naturally to be expected the treatment of general paralysis by infection with malaria or recurrent fever is given in detail. The importance of the examination of the cerebro-spinal fluid is emphasized, and full descriptions of the correct methods of performing lumbar puncture and of examining the fluid by many laboratory procedures are described, with admirable illustrative coloured plates. The results of treatment with various drugs are set out, and the difficulties of assessing the values of the treatments recommended are fully recognized. The book will be found of value by all who are directly interested in the diagnosis and treatment of syphilis of the central nervous system.

[2] *La Syphilis Experimentale. Etude Critique et Nouvelles Recherches.* Par P. Gastinel et R. Pulvenis. Paris: Masson et Cie. 1934. (Pp. 244 ; 19 figures, 4 plates. 45 fr.)

[3] *Une Nouvelle Syphilis Nerveuse. Ses Formes Cliniquement Inapparentes.* Par Paul Ravaut. Paris: Masson et Cie. 1934. (Pp. 196. 45 fr.)

[4] *Moderne Therapie der Neurosyphilis.* Von Bernhard Dattner. Wien: Verlag von Wilhelm Maudrich. 1933. (Pp. xii + 334 ; 36 figures ; 8 coloured plates. RM. 22.)

MEAT INSPECTION

The sixth edition of Professor EDELMANN's *Meat Hygiene*,[5] revised by Drs. J. R. Mohler and A. Eichhorn, reproduces and amplifies the good features presented by an earlier issue, which we reviewed in 1917. The comparative anatomy of the meat animals is discussed, the differential characters of the various meats are set forth, and consideration is given also to methods of cooking and preservation. A substantial section is devoted to the regulations governing the meat inspection of the United States Department of Agriculture. A detailed account of inspection procedure follows, including a note on peculiarities within physiological limits. Next come in order, well and amply described, the numerous parasitic diseases of meat, together with one chapter on poultry, fish, and crustaceans, and another on food poisoning. A point in the book is the attention directed to meat products and the risk of their bacterial contamination during preparation or afterwards. In the section on slaughter, the praise accorded to the knocking hammer, as employed in America, is probably justified. We have seen it used with humanity and precision in the Chicago stockyards. The superiority of the captive bolt pistol to certain other methods of killing listed is, however, insufficiently brought out, and electrical stunning, now introduced into abattoir practice in this country, is dismissed with the remark that experiments have been made to kill animals with electricity.

The illustrations and coloured plates are of a high order, though the drawings of the flies which concern themselves with meat are not up to the general standard. The work is intended for the information of meat consumers and for the guidance of those engaged in meat inspection. We think that it will serve both these objects in a thoroughly competent manner, and we recommend it to meat inspectors and medical officers in this country as a source of full and reliable information on the subject with which it deals.

PROTOPLASM AS A COLLOID

It has long been recognized that protoplasm behaves as a fluid, and that its solid constituents are not arranged in the form of anything like a fixed structure. It is a liquid, not a solid, and often a viscous liquid such as is classed by colloid chemists among the colloid solutions, or lyophilic colloids, of which examples are furnished by watery solutions of soaps, glues, and so forth. It has commonly been supposed that the massive and complex molecule of protoplasm, or biogen molecule, if such a thing may exist, is dissolved in the water that forms the major part of its substance ; or, if the idea of the biogen molecule seems too simple, one may say that protoplasm is a complex of substances of various chemical natures and in various states of aggregation, dissolved in water to form a sol while alive and liable to precipitation in the form of a gel when overtaken by death. In protoplasm and, indeed, in living tissues generally, it is the water that is commonly supposed to act as the solvent and to hold the solid constituents in colloid solution. The opposite view, however, is held by MARTIN FISCHER and MARIAN HOOKER,[6] who argue that protoplasm or, more generally, living matter, including the tissue juices like blood and lymph, is in essence a solution of water in a colloid matrix. Living cells, according to this view, are not droplets of dilute solutions in which colloid molecules (protein, fat, and carbohydrate) are suspended, but are described as lyophilic colloid systems, in which the water is dissolved in, and actually bound to, the colloid material. Protoplasm is briefly described as a base-protein-acid hydrated compound, an amphoteric electrolyte that is a solvent for water. Various applications of this revolutionary view of the constitution of living matter are made by Fischer and Hooker to such medical phenomena as oedema, acidosis, alkalosis, and the so-called permeability of living cells ; they have abundant experimental methods and results to prove the correctness of their views, and argue that the physics and chemistry of dilute solutions, so long applied to the problems of living matter, should now be disregarded. They would concentrate attention on what, for lack of a better name, they call " solutions of inverse type "—solutions, that is, in which the dissolved substance is the water, the solid is the solvent.

LAW FOR THE ORDINARY CITIZEN

The plain man's ignorance of law is usually profound. This is unfortunate, for ignorance is no excuse for his breaking it. Moreover, it is no easy matter for him to ascertain the law on any given point. Legal textbooks are practically useless to him, and there are not very many good books which will explain the law to him in intelligent language. Some books of the type of *Everyman His Own Lawyer* are useful, but necessarily express themselves in general terms and attempt to cover too wide a range. *The Citizen and the Law*,[7] by " Solicitor," is without exception the best we have ever seen. One of its chief features is its vigorous detachment from the legal system, its humorous condemnation of the law's worst defects, and its wealth of illustrative anecdote. The author treats of such general subjects as litigation, the police, and dodging the law—which chiefly concerns income tax and bankruptcy—and deals at length with everyday puzzles in the field of household servants, motoring, and sport. He gives a very clear summary of the law of family relationships and of divorce. The chapter on doctors sets out shortly the law of qualification and the powers of the General Medical Council. " Solicitor " considers, rather surprisingly, that doctors charge too much. While he admits that many doctors charge moderate fees or none at all to people without means, he suggests that some check ought to exist on doctors' bills similar to that by which solicitors' charges are taxed by officers of the Court. To his statement that to defend an action brought by a medical practitioner to recover his fees is generally useless, many doctors will be able to find a reply from bitter experience. One of the most serious and common bugbears of the doctor is the patient who brings a counter-action for negligence in order to avoid a perfectly reasonable account, and such actions, owing to the usual sympathy of a jury with an ex-patient, not infrequently succeed. To appoint, as the author suggests, commissioners in every district to review doctors' bills would be an obvious and unjustifiable interference with private interests and the relationship between doctor and patient. It would be just as reasonable to have a similar tribunal to review the charges of every tradesman. Such tribunals have been set up in times of emergency, but there is no record that the results obtained were strikingly successful. Nevertheless, one can bear " Solicitor " no grudge for his opinions, which are sincerely held and add greatly to the interest of his book.

---

[5] *Text-book of Meat Hygiene. With Special Consideration of Antemortem and Postmortem Inspection of Food-producing Animals.* By Richard Edelmann, Ph.D. Sixth revised edition by John R. Mohler, A.M., V.M.D., D.Sc., and Adolph Eichhorn, D.V.S. London: J. and A. Churchill, Ltd. 1934. (Pp. 474 ; 162 figures, 5 coloured plates. 28s.)

[6] *The Lyophilic Colloids. Their Theory and Practice.* By Martin H. Fischer and Marian O. Hooker. London: Baillière, Tindall and Cox. 1933. (Pp. 246 ; 84 figures. 22s. 6d.)

[7] *The Citizen and the Law.* By " Solicitor." London: George Routledge and Son Ltd. 1934. (Pp. xiii + 249 ; 7s. 6d. net.)

Notes on Books

PERKIN and KIPPING'S *Organic Chemistry*, Part III,[8] incorporates those matters which are not usually presented in a fundamental course of instruction in the subject. Such matters naturally include the newer developments of theory, the results of recent important research, questions which still await a complete explanation, and descriptions of organic substances of more than ordinary complexity. These are discussed in this part. They include the theory of valency, which is based on the behaviour of electrons, the relation of physical properties to molecular constitution, and various forms of geometrical isomerism. There is also a more extended treatment of the subject of optical isomerism than that given in the foregoing section of the work, together with an account of the optically active forms of nitrogen, tin, silicon, and sulphur. A considerable part of the volume is occupied with the study of certain groups of interrelated substances, among which are found the saccharides, the terpenes, and the carotenoids, but the alkaloids are not here included. Room has, however, been found for a monograph on the more remarkable forms of tautomeric change occurring in organic substances. All these matters are discussed with special regard to the needs of students intending to take the honours degree. The book has been carefully prepared, and forms a fitting supplement to Parts I and II of the authors' work.

In their little book on *Sex in Marriage*[9] Mr. ERNEST R. GROVES, research professor of sociology in the University of California, and his wife, Mrs. GLADYS H. GROVES, have attempted to give sex information to those entering marriage, in the manner and the spirit of a book for beginners in housekeeping and child nurture. The subjects discussed include the elementary anatomy and physiology of the sexual organs, the love art of husband and wife, common problems of marriage, and birth control. A short bibliography of English works is appended.

The fifth volume of the German publication on the Results of General Tuberculosis Research[10] contains much of interest for workers dealing with this disease. Three of the six contributions in the present collection deal with tuberculosis in childhood. Professor Stefan Engel has written a masterly review on "The Hilus of the Child," which closely correlates pathological and radiological findings. Professor Hans Opitz deals with the difficult question of whether children with intrathoracic tuberculosis can act as sources of infection, and concludes that there is more danger for other children than is generally realized. Dr. K. Mattison (of Sweden) discusses the fate of school children infected with tuberculosis, and covers a very wide field in the whole question of the age of infection and the resultant mortality and morbidity.

We have received a copy of the latest issue of the *Liverpool Medico-Chirurgical Journal*, vol. xlii, Part I.[11] This contains an interesting article on language, jargon, and modern medicine by Dr. Herbert R. Hurter. Two historical articles by Sir D'Arcy Power and Professor John Hay (the latter being the Commemoration Address on the Centenary of the School of Medicine) are followed by practical papers on midwifery analgesia and allergy by Drs. R. J. Minnitt and R. M. B. MacKenna, while Professor Walter J. Dilling offers a scholarly contribution on David Waldie, prophet of the anaesthetic properties of chloroform.

[8] *Perkin and Kipping's Organic Chemistry*. Part III. By F. Stanley Kipping, Ph.D., Sc.D., F.R.S., and F. Barry Kipping, M.A., Ph.D. London: W. and R. Chambers, Ltd. 1934. (Pp. 967.)

[9] *Sex in Marriage*. By Ernest R. Groves and Gladys H. Groves. With an introduction by Dr. Harry Roberts. London: Gerard Howe, Ltd. 1934. (Pp. 251. 6s. net.)

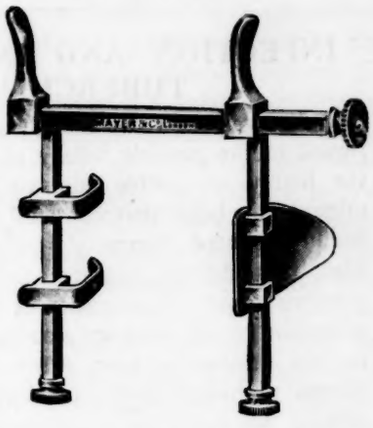
[10] *Ergebnisse der gesamten Tuberculoseforschung*. Band V. Leipzig: G. Thieme. 1933. (Pp. 427; 128 figures. M.43; geb. M.45.)

[11] *The Liverpool Medico-Chirurgical Journal*. Edited by R. Coope, M.D. Liverpool: Medical Institution; London: H. K. Lewis and Co., Ltd. 1934. (Pp. 132. 2s. 6d., published half-yearly.)

Preparations and Appliances

RETRACTOR FOR EXTERNAL FRONTAL SINUS AND ETHMOIDAL OPERATIONS

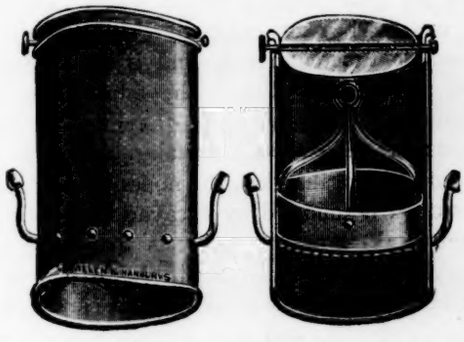
Mr. GILBERT H. HOWELLS (London, W.1) writes: The instrument described and illustrated here has proved most satisfactory in use. The broad, curved blade slips in under the orbital periosteum and retracts the orbital contents without any danger of damaging the eyeball. The two small hooks on the opposite arm slip under the integuments, and, owing to their mobility on the arm, will adapt themselves to the curve of the incision. It is made by Messrs. Mayer and Phelps, Chiron House, 59, New Cavendish Street, London, W.1.



MODIFIED ETHER INHALER

Dr. F. R. GUSTERSON (Worthing) writes: Having found Mr. Denis Browne's ether inhaler very useful for anaesthesia in children, I have modified it in the following details, and use it as a routine for adults.

1. The face end has been made wider, and the sponge rubber facepiece dispensed with, a piece of gamgee being used.
2. Two gas tubes have been inserted so that oxygen and CO_2 can be administered if necessary.
3. A lid with revolving shutter has been fitted. This enables a certain amount of rebreathing to take place, easily controlled by rotating the shutter.



I usually induce with ethyl chloride, the shutter being off. I go on as soon as possible to pure ether, the shutter being placed in position and gradually closed down. By this method the patient only breathes a warm ether vapour, a constant depth of anaesthesia can easily be maintained, and the actual amount of ether used is very small. For an abdominal operation lasting one hour, including induction, I use about 6 to 8 ounces of ether all told.

I have to thank Messrs. Allen and Hanburys for several helpful suggestions and for making this model.

HEAT-STERILIZED SURGICAL DRESSINGS

We have received from Messrs. Southall Bros. and Barclay Ltd. samples of dressings in sterilized packets which have been sealed by an ingenious new method. The dressing is packed completely, except for a small aperture which is covered by a film of resinous compound. It is then sterilized by moist heat at 125° C. The final drying process, at 130° C., causes the resinous film to adhere to the wrapper and thus to close the packet entirely. This automatic sealing during sterilization avoids any danger of contamination that may arise when packets are sealed after removal from the autoclave.

British Medical Journal

SATURDAY, SEPTEMBER 8th, 1934

INFECTION AND IMMUNITY IN TUBERCULOSIS

The discovery of "Koch's phenomenon," and a disregard of the possible fallacy of comparing man with the highly susceptible guinea-pig, undoubtedly gave origin to the belief that non-fatal infection with tubercle bacilli produced immunity against subsequent reinfection. It is admitted, however, that whilst this immunity prevents rapid generalization it is, as a result of the tuberculin hypersensitivity associated with it, responsible for the destructive form tuberculosis assumes in the chronic phthisical adult. Clinical support for this view seemed to have been obtained when severe and generalized forms were found to be the rule in adults of native races—presumably the result of lack of childhood exposure to infection. When it was demonstrated that a positive tuberculin test proved tuberculous infection it seemed reasonable to assume that a positive test also indicated immunity. Two types of pulmonary tuberculosis were thus differentiated, recently labelled "childhood" and "adult" types by the American National Tuberculosis Association. The former, which is the result of primary infection, usually occurs in children, may be localized in any part of the lung, and involves the corresponding lymph nodes; and caseous lesions usually became calcified. The process results in a positive tuberculin test, and is not uncommonly followed by generalization. The adult type, on the other hand, which is the result of reinfection (whether exogenous or endogenous), usually occurs in adults, and is apical in localization, the nodes are not involved, and caseation is followed by excavation and fibrosis.

Recent work, however, suggests that these conceptions may have to be much modified. Rich[1] has shown that tuberculin hypersensitivity and immunity can exist independently, and that hypersensitivity may be abolished while immunity persists. Research in South Africa[2] has shown that nearly 70 per cent. of the "boys" arrive at the mines tuberculin-positive, and that "a highly fatal type of combined pulmonary and 'generalized' tuberculosis" is more common among those who were positive—clinical evidence of the disappearance of immunity while hypersensitivity persists. Moreover, recent investigations among medical students and nurses indicate that the response of the adult white to a first infection also differs entirely from that of the negro. Heimbeck[3] found that nearly all the Pirquet-negative probationers—about half the number—become positive before the end of their training (during which they come in contact with over 300 tuberculous patients), and that 29.6 per cent. develop some clinical manifestation of tuberculosis, as contrasted with 2.6 per cent. in those Pirquet-positive. A very large percentage of these "manifestations"[4 5] consist of erythema nodosum and pleurisy, and "pulmonary infiltrations" appear to be of the mild childhood type. Greer[6] found that nearly all the 70 per cent. of nurses who were tuberculin-negative (Mantoux 1 in 100) on entrance became positive, but, since 1930, only three (about 2 per cent.) have developed "tuberculous disease"—two pleurisy with effusion, and one a parenchymatous lesion of adult type. Shipman and Davis,[7] on the other hand, state that the majority of the 40 per cent. tuberculin-negative nurses (Mantoux 1 in 10,000) did not become positive later, and that most of those who developed clinical tuberculosis were tuberculin-positive on entrance. They point out, however, that their nurses had little opportunity for tuberculous contact. Myers[8] finds that nearly all the tuberculin-negative medical students at Minnesota University become positive during their training, but that this is accompanied in less than 25 per cent. by symptoms or physical signs (which consist of pleural effusion and/or small *x*-ray shadows, which soon disappear). Reviewing the subject, he notes that adults tolerate well the first infection type of tuberculosis, and that it differs in little respect from that in children, most of whom also pass through this phase without symptoms other than a positive tuberculin reaction. Naturally a smaller number of such cases are seen in adults (in whom they are detected only by systematic routine examination), and in children miliary and meningitic forms not uncommonly follow. Myers concludes that "the development of rapidly progressive and highly destructive disease in adults who have not been previously infected is apparently a myth." His views therefore support Stewart's[9] plea for the use of the terms "first infection type" or "primary tuberculosis," and "reinfection type." The latter would probably cause less confusion at a time when the tuberculin sensitization appears to be much lower than is commonly considered.

It is essential to point out the lack of uniformity in the criteria adopted in these investigations as regards the type of tuberculin test employed, definition of clinical tuberculosis, and the opportunities for contact. The last is of great importance also in attempting to answer the question often put as to whether a tuberculin-positive or -negative child or nurse is more liable to "develop tuberculosis." According to the views quoted here the following would appear to be a "working" answer. When both are exposed to massive contagion the negative individual will almost certainly develop a symptomless or mild primary tuberculosis, which may become generalized in a child. The positive individual (child or adult) will perhaps develop

[1] *Lancet*, 1933, ii, 521.
[2] *Pub. South African Inst. of Med. Research, Johannesburg*, 1932, vol. v., No. 30.
[3] *Acta Med. Scand.*, 1930, Supplementum No. 34, p. 143; *Presse Méd.*, 1932, xl, 528; *British Medical Journal*, Epitome, 1932, ii, para. 27.
[4] *British Medical Journal*, Epitome, 1927, ii, para. 243.
[5] *Ann. de l'Inst. Pasteur*, 1929, xliii, 1229.
[6] *Arch. Int. Med.*, 1932, xlix, 77; *Trans. Nat. Tuberc. Assoc.*, New York, 1932, p. 118.
[7] *Amer. Rev. Tuberc.*, 1933, xxvii, 474.
[8] Ibid., 1933, xxix, 93.
[9] *Journ. Amer. Med. Assoc.*, 1933, c, 1077.

chronic phthisis (exogenous reinfection). This may presumably also occur later on in a primarily infected individual if the contact is prolonged. When there is no source of contagion the positive individual is at a disadvantage, as any lowering of his general or specific resistance may result in chronic phthisis (in both adult or child) owing to the presence of living bacilli somewhere in the body (endogenous reinfection). And clearly there is much more opportunity for lowering of the resistance in the adolescent than in the school child. If a primary tuberculous infection can be said to constitute an *individual* handicap—and prevention should consist in avoiding as long as possible a first infection with *virulent* bacilli—a positive tuberculin test may theoretically prove to be so in another way. B.C.G. vaccination is said to produce tuberculin hypersensitivity as well as immunity. While the vaccinated child would benefit by the prevention of generalized forms, the protected adult, who is not liable to the latter, might after vaccination be at a disadvantage when meeting his first virulent infection owing to this destructive hypersensitivity. It would be of great interest to have full individual details, in addition to numbers, of the tuberculous cases amongst Heimbeck's[3] B.C.G.-vaccinated and non-vaccinated nurses originally Pirquet-negative.

FALLACIOUS GENERALIZATIONS

It seems to us necessary to utter a word of protest about an article which appeared in a recent number of *The Listener* under the title "The Frustration of Medicine." This is the more needed in that the article was written by Professor Mottram. Anything he says is bound to have considerable weight, and should carry with it the assurance of scientific thought and accurate statement. The article in question does not confirm this assurance. Of course nothing written by Professor Mottram can be wholly without value, and in this article he points out the real need for further financial aid for medical research, illustrating this need by several excellent examples of what might be easily accomplished if adequate means were forthcoming. His main theme would seem to be the unfortunate effects of the lag in the practical application of the results of research in the medical field, and of the unscrupulous exploitation of some of those results for commercial rather than for scientific purposes. Here is a subject whose discussion might have been of great interest and value, though the reasons from which this lag arises are by no means necessarily unworthy.

Professor Mottram, however, departs widely from this main theme, and the general effect of a large part of his article on the great majority of his uninformed readers must be to produce a false impression, both as to medical education and as to the knowledge, skill, and even honesty, of general medical practitioners. Here again, of course, it has to be admitted that there are serious defects in medical education (though the standard attained in this country may be truly described as the highest in the world), and that among the many thousands of general practitioners there are a number who fail to live up to their opportunities. It is, however, unwarrantable, and may indeed be highly mischievous, to build upon these defects or exceptions such general statements as Professor Mottram makes. It is not true to say that "the academic part of the medical student's training is hopelessly inefficient"; that "in ninety-nine cases out of a hundred he sloughs his scientific training when he enters the wards"; that of "biology, chemistry, physics, physiology, and anatomy he gets but a smattering, and of their serious import nothing"; that "only when the medical student is at last in the wards does he come into contact with anything which seems even remotely connected with his life's work." Incorrect, too, is the general statement which Professor Mottram makes that "it is only by a deep critical study of a subject that a man can begin to discover the spirit of scientific work." Happily even more than a beginning can be made by something less than this, otherwise not merely medical education but all general education would be impossible in less than a life-time of study, and then only for a few. Again, as to post-graduate study in some reasonable form, Professor Mottram is unduly pessimistic. He "hails with delight" the establishment of the new post-graduate medical school at Hammersmith, but prophesies that it will be attended only by "medical officers of health whose local authorities have the wisdom to subsidize them, keen private practitioners with private means, and budding consultants." The use made even of the existing limited facilities does not justify any such forecast; and has Professor Mottram never heard of the fund which enables certain insurance practitioners, whose circumstances would otherwise make it very difficult for them, to attend post-graduate courses?

Apart from this erroneous description of the general practitioner's education and of his attitude towards advances in professional knowledge and practice, the one concrete example which Professor Mottram gives of the inadequacy of the G.P. is with regard to the use of insulin in the treatment of diabetes. He says: "The general practitioner has neither the time nor the scientific background to understand the factors at work in producing diabetes nor the relation of insulin to diet and intercurrent disease." We cannot accept this of general practitioners as a class. It is true that the initial experimentation with a view to securing the correct balance between diet and the insulin dosage must in many cases be conducted in hospital, but Professor Mottram knows that this is a relatively short business and that the conduct of these cases is as a rule successfully supervised over a period of years by the general practitioner. Again, is Professor Mottram not aware that insulin can be, and is, obtained for insured persons as readily as any other drug or preparation, and that the treatment of diabetes among such patients by insurance practitioners is a commonplace?

It is no reply to say that such treatment is unsuccessful because diabetics ultimately die.

It would be germane to inquire of Professor Mottram what is the implication of his statements that " no poor person, no one without well-to-do relatives to back him, can easily enter the medical profession: a career is not open to talent unless there is financial backing," and that " at the end of his training he is stranded . . . if he has no private means." Even in the days when scholarships were far less abundant than now these disabilities were frequently overcome ; and, though the existence of certain scholarships is admitted in the article, there is no mention at all of the " senior scholarships " of local education authorities which of recent years have been granted, in quite numerous instances, to deserving students with inadequate means to enable them to pursue a medical course. But the statements quoted have no real force unless Professor Mottram believes, as he seems to imply, that everyone who " thinks he would like to be a doctor " and has passed the necessary preliminary tests ought to be supplied from public resources with the funds to go through his medical course and to set up in practice.

THE SWAB IN DIPHTHERIA DIAGNOSIS

A remarkable diversity of opinion and practice is revealed in the correspondence recently published in these columns on the subject of diphtheria diagnosis. Its origin is the allegation by Dr. E. James, supported by Dr. Sanctuary, that the results of swab examinations are so untrustworthy that swabbing were better abandoned. This, of course, should not be so. For a false report the blame may lie either with the practitioner or with the bacteriologist ; a false negative usually with the former, since its common cause is failure to apply the swab to the actual site of the lesion. The technique of swabbing is an important factor, and it should be more generally realized that the lesion in diphtheria (when it is not laryngeal or nasal) may affect only a small area on the fauces ; the swab should be applied to this and this alone, and not rubbed indiscriminately over a wide area. Likewise a swab heavily contaminated with saliva should be rejected, and the process repeated with another. The false positive may have one of two chief explanations: the patient may be a carrier of diphtheria bacilli and yet be suffering from a tonsillitis due to some other micro-organism ; or the bacilli cultivated, although having a typical or suspicious appearance, may be avirulent diphtheria bacilli or diphtheroids. A positive report is the only safe course in doubtful cases pending further laboratory investigation. The errors due to all these causes should not be so numerous as to lend any support to Dr. James's proposal, and the answer to his complaint is better technique both at the bedside and in the laboratory. That the swab has many other uses than the diagnosis of the doubtful acute case we are reminded in the letters of Dr. A. G. Newell and Dr. French. That the laboratory might do more than it usually does to obviate delay, especially at inconvenient hours, when the post serves poorly, and at week-ends, is probably the opinion of many. This is in part a question simply of transport, communications, and working hours ; but in one respect it may be a question of technique, and if Dr. Ponder's admirable practice of examining direct films were generally followed, not only would most cases of frank diphtheria receive laboratory confirmation at once instead of on the following day, but fewer cases of Vincent's angina would go unrecognized, as unquestionably they often do at present. This proceeding, however, calls for a greater expenditure of time and a considerably higher degree of skill—if it is to yield the full results of which it is capable—than the ordinary practice of culture alone. The gravest conflict of opinion in this correspondence concerns the clinical aspect of diphtheria and the possibility of diagnosing the disease by its physical signs. The letters of Dr. A. T. Blease and Dr. Newell present a sharp contrast in this connexion, the former insisting that a diagnosis is sometimes impossible on clinical grounds, the latter emphasizing the well-known clinical points of distinction between diphtheritic and streptococcal tonsilliitis. We find another divergence of opinion between the letters of Dr. P. R. Wallis and Dr. D. M. Gray: the former contends that if enough suspicion of diphtheria exists to call for a swab examination that suspicion demands the immediate administration of antitoxin ; the latter recognizes a class of case in which antitoxin may be withheld until a swab report is obtained. Dr. Wallis would no doubt except from his rule the case in which a swab is only taken as a safeguard against a remote contingency ; his proposal is incompatible with the suggestion that all sore throats should be swabbed. To pretend to judge between the conflicting opinions of so many experienced observers is more than we wish to undertake, except to propose the lame though obvious compromise that every case must be judged on its merits, taking into account not only the features of the case itself but the surrounding circumstances. If every practitioner devoted as much thought to this subject as the writers of these letters, it would become evident that diminishing the dangers of diphtheria is less influenced by matters of disputed clinical policy than by alertness and determination to take effective steps of some kind with the least possible delay. This whole controversy is, of course, superseded in importance by the issue introduced in the last sentence of Dr. Newell's letter. Our main business as a profession should not be to cure diphtheria but to prevent it, and if any further public health officers are to be appointed to deal with this problem, as is suggested by Dr. Crawford, prevention should be at least their chief concern. The number of children immunized in this country is still lamentably small, and much more could be done by the practitioner as well as by many public health authorities in advocating timely immunization. That this is an effective proceeding, and not merely safe but often unattended by even slight discomfort, should be preached insistently. Misguided public opinion has a lot to answer for, and in no respect is it more to blame in this country than in its attitude to all methods of immunization ; between the ultra-moderns who believe in nothing unless they get it through a hypodermic needle and that large section of the population which maintains an almost religious prejudice against any sort of " inoculation " the common-sense intermediate class is still smaller than in many other countries.

BIOGRAPHY IN MEDICAL HISTORY

Of the six main articles in the July instalment of the *Annals of Medical History*[1] three deal with biography and three more or less with the wider aspects of the evolution of ideas, thus holding a balance on the question whether information about individual leaders and prominent members of the profession, or the progress of medical science, or both combined, should be the real object and ideal use of medical history. Thus baldly stated it is clear that medical history should be primarily devoted to consideration of fundamental principles and the development of ideas. But this is not all ; the record of a man's life may be small beer and gossip, which, however attractive to the casual reader, is not of any permanent value, whereas the biography of a Hunter, Harvey, Pasteur, Lister, or a Virchow may describe and explain the birth and gradual growth of new conceptions and solid discoveries. In the case of science it would not be impossible to expand Thomas Arnold's definition of history generally as the biography of nations. The personal interest may be combined with the history of the achievements initiated or furthered by the individual. Thus the first article in this number of the *Annals*, that by Dr. Birkhaug of Paris on Albert Léon Charles Calmette, which may be included among the three of a biographical character, sets out the record of his work on tuberculosis, the history of the Bacillus Calmette-Guérin (B.C.G.), the invention and success of antivenin serum, and his recent work on cobra venin and its cytolytic action, with its possible application to human malignant disease. The graphic account of his persecution by the Germans when they captured Lille shows that there is an exception to prove the rule that science has no frontier boundaries. In contrast to this are the lives of two American practitioners, eminent in their, but not in all, time. The first, Walter Brashear, was a brilliant surgeon who, after an adventurous visit to China, declined a chair of surgery in Paris and retired thirty-six years before his death at the age of 84 in 1860 in order to make a fortune, first in politics, then in trade and planting in Louisiana, and was never a writer or a teacher. Dr. Guy Hinsdale's biographical note on the second, J. P. Moorman, gives the details of a resident physician at the White Sulphur Springs, Virginia, for the long period of forty-five years ; he sat for two terms in the Virginia House of Delegates and for forty-five years was an elder in the Presbyterian Church. In his article on men and events in the history of the Philadelphia Pathological Society Dr. David Riesman combines many thumb-nail sketches of its presidents and of a few honorary members with a review of the changes that pathology has gone through in three-quarters of a century. Of one honorary member he says: "Virchow did for pathology what Vesalius did for anatomy." The influence of the Paduan professor's *De Humani Corporis Fabricâ* on anatomy can be judged by Dr. W. T. Dempster's account of European anatomy before Vesalius. Another useful article is Dr. A. E. Fossier's history of medical education in New Orleans from 1834.

[1] *Annals of Medical History*, New Series, vol. vi, No. 4, July, 1934. Edited by Francis R. Packard, M.D. New York: Paul B. Hoeber, Inc. ; London: Baillière, Tindall and Cox. (Pp. 291-380 ; illustrated. Volume of six numbers, £2 15s. ; single number, 12s. 6d.)

MALARIA IN TRINIDAD AND TOBAGO

In a recent public lecture at Port-of-Spain Dr. E. de Verteuil, acting deputy surgeon-general, described the malarial survey of Trinidad and Tobago which began in 1930, and which had revealed a high spleen and parasite rate in several areas. Atebrin had been found effective in destroying the parasites inside the human host. While pond breeding places had been brought under control, the problem of dealing with the rice fields remained for solution. In Indian settlements and native villages a high degree of immunity seemed to have developed, but until the mangrove swamps had been attacked such towns as Port-of-Spain were riddled with malaria. Some of these swamps still persisted, and called for eradication. A similar process of land reclamation and parasite control had been extended along the shores, rendering it possible for new villages to come into existence without increasing the liability to infection. For the last three years special attention had been directed to the rice fields. Drainage operations were now being conducted with a view to the abolition of breeding places, and considerable success had been achieved, especially in those detected near the larger centres of population. These had resulted also in the improvement of the general sanitation, the provision of recreation grounds, street widening and the opening up of crowded areas, and the relief of housing congestion in certain parts of Port-of-Spain. Tobago still needed energetic treatment, for the malarial strains there were particularly virulent. Only a few swamps would have to be dealt with to ensure the permanent extinction of the disease in a year or two.

THE SPLEEN AND CARBOHYDRATE METABOLISM

The modern conceptions as to the function of the spleen do not in general include that of an endocrine organ. The suggestion was recently put forward by certain Japanese workers that the spleen had an anti-parathyroid function, the removal of the organ in rabbits leading to a marked increase in serum calcium: injection of splenic extracts were reported as diminishing it. This work has not as yet been confirmed, and it is not easy to reconcile such findings with either the histological structure of the organ or the results of its ablation in man. The possibility of some connexion between the spleen and sugar metabolism was put forward as long ago as 1924 by Charles Richet and some of his pupils. Thus Rathery found that the extirpation of the spleen in dogs led to a more or less persistent rise in free and combined carbohydrate in the blood, suggesting that the spleen might contain or elaborate an insulin-like substance. That a certain amount of insulin may be extracted from tissues other than the pancreas is well known, but the results of Rathery were interpreted as indicating the presence of a substance other than insulin. More recently Fiessinger and his co-workers have reopened the question, and in a new series of experiments Rathery, Cosmulesco, and Grignon[1] re-examine the problem. These authors used an extract of spleen and followed the effects on the blood sugar of dogs after intravenous injection under

[1] *Presse Méd.*, June 13th, 1934.

various conditions. Details of the preparation of the extract are not given, but it appears to have been obtained by simple defatting and deproteinizing the splenic tissue. Having satisfied themselves that the blood sugar depressing effect was demonstrable in dogs, they proceeded to try it on diabetic human subjects; 2 c.cm. of the extract being injected intravenously. In eight out of ten cases the injection was followed by a more or less marked fall in blood sugar, the maximum fall being reached about one and a half hours after the injection, and the original level again in some two to three hours. In association with insulin the spleen extract seems to accentuate the insulin action. The suggestion is made that it might be useful to combine insulin injection with that of spleen extracts in certain cases of diabetes. The possible existence of a sort of activator of insulin in the body has been put forward recently by Himsworth, and it may be that the splenic extract here considered is of importance in this connexion. In none of the cases of diabetes treated with the spleen extract was there any question of hypoglycaemia, the fall in blood sugar rarely exceeding some 30 to 40 mg. per 100 c.cm. No suggestion is made (perhaps wisely) as to the mechanism of action of the spleen extract.

THE NATION'S FOOD SUPPLY

The Food Investigation Board, which has as its primary object the improvement of the food supply for the people of this country, has always followed the practice of according precedence first to home-grown, then to Empire, and finally to foreign produce. In its annual report, issued on August 20th by the Department of Scientific and Industrial Research, are reviewed the aims of the research work, now costing some £45,000 a year, which has been carried out on the transport and storage of foodstuffs. For example, the Torry research station finds that the period during which fish can be kept in first-rate condition on a trawler by the customary method of stowage in crushed ice can be extended from five to seven days to ten to twelve days. Work has also been done on the herring, with a view to improving the smoking of this fish and the production of a milder salt-cured herring. The latter has been obtained by a compromise between salting and cold storage. One interesting point emerges here—that kippers made from herrings which have been rapidly frozen in cold brine and then stored at low temperature for as long as four months are barely distinguishable from kippers made from the freshest fish. As regards meat storage, investigation has shown that beef can be maintained in perfect condition in the chilled state for sixty to seventy days in a 10 to 20 per cent. atmosphere of carbon dioxide, so that, providing gas-tightness can be secured in ships' refrigerated spaces, it would be possible to send Australian and New Zealand beef to this country in chill. Bacon cannot be stored successfully for any length of time by cold alone, and experiments have shown that this difficulty may be to some extent solved by the use of a complete atmosphere of carbon dioxide. Fruit storage is a somewhat complicated problem, and the best temperature for each variety can be found only by careful trials. There are now twelve gas stores for apples in this country, and several more are in course of construction. Most of them are intended for England's most important cooking apple, the Bramley seedling. It is interesting to note that the correct atmosphere for these apples can be obtained by allowing them to produce their own carbon dioxide and controlling its amount by regulating the ventilation. Empirical storage trials should yield much important information as to the possibilities for other apples, and considerable progress has been made during the last two years with Cox's orange pippin. The flavour is, however, apt to be elusive: in this apple full flavour is not developed after effective gas storage until the fruit has been subsequently kept in air at ordinary room temperature for several days. Further research is being undertaken on these points. Other activities of the Food Investigation Board include work in an experimental ship's hold at the Ditton laboratory. This is designed to improve conditions under which foodstuffs are carried on board ship.

CONTROL OF TRAFFIC IN NARCOTIC DRUGS

The annual statement prepared by the Home Office for the League of Nations on opium and other dangerous drugs[1] reports that during 1933 there were no considerable seizures nor indications of illicit traffic in Great Britain, and repeats the assurance that "drug addiction is not prevalent" in this country. The alkaloids codeine (methyl-morphine) and dionin (ethyl-morphine) have now been brought under control as regards manufacture and distribution, import and export. Last year 35,890 ounces of codeine were produced and 23,366 ounces exported direct by the manufacturers. Great Britain is innocent of production of raw opium, prepared opium, Indian hemp, and coca leaves. Cocaine is, however, permitted to be manufactured by one firm in London, and last year 16,023 ounces were so produced. Two firms, both in Edinburgh, are licensed to manufacture morphine, and 30,757 ounces of morphine alkaloid and 44,169 ounces of morphine salts were produced last year. It has, however, to be remembered that morphine is largely used for conversion into codeine, 26,089 ounces having been so utilized in 1933. The export of British-made morphine was less than in the previous year and greatly less than was the case only a few years ago; 16,156 ounces were exported in 1933. While the story of unmasking illicit traffickers in narcotics in this country is not as dramatic as that related by Russell Pasha in Egypt, two cases of interest are noted in the Home Office report. One arrest in September, 1933, made by the London police on information from Canada of a trafficker in opium when landing, disclosed that the illicit supplies were derived from one Karl Jorgenson, a Norwegian resident in Belgium, who has since been expelled from that country. In the other case Gandarillas, a Spanish subject, was found, on landing at Southampton from Havre on a transatlantic liner, to be in possession of 140 lb. of opium. Communications with the German police traced the source of this

[1] The Traffic in Opium and Other Dangerous Drugs. Report to the League of Nations by His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland for 1933.

contraband to one Otto Janffmann of Hamburg, who was found to be identical with the well-known trafficker Edward Bender, who, when released on bail in America, had fled to Europe. According to the latest information Bender is awaiting trial in Hamburg for offences in connexion with narcotics among others. The new draft convention for the suppression of illicit traffic in dangerous drugs is now being submitted by the Council of the League of Nations to the various Governments in an amended form ; twenty-three Governments have thus far indicated approval, while the United States and South Africa have intimated that they are not prepared to participate in the new Convention.

ENGLISH HOSPITAL DEVELOPMENTS

The Quarterly Bulletins of the Health Organization of the League of Nations can be relied upon to contain valuable and accurate summaries of national or international health activities in some part of the world which form material for the information and guidance of other responsible health authorities. Extract No. 8 of volume iii of these Bulletins, now published as a separate pamphlet under the title *Recent Tendencies in the Development of General Hospitals in England*,[1] is no exception to this rule. It is compiled by Dr. Melville D. Mackenzie, a member of the Health Section of the League of Nations secretariat, and is a model of accuracy, selection, and arrangement. It is in two parts, the earlier dealing with matters of hospital administration, the later with those of hospital construction. Neither part contains much that is not known to those who are actively associated with either of these aspects of hospital work, but nowhere else, within relatively small compass, can be found such a complete and reliable survey of these fields. The work of the British Medical Association in relation to hospital policy and administration is acknowledged and adequately set out in relation to medical staffs, pay-beds, provident schemes, contributory schemes, out-patient departments, and the collaboration between voluntary and council hospitals. The peculiar position of nursing homes in the English system is described, and the ways in which they are beginning to be brought under regulation by local authorities are noted. In this connexion the "home hospitals" mentioned in the Association's Scheme for a General Medical Service for the Nation are referred to, and some of the reasons which make such provision necessary are stated. The question of establishing or continuing special hospitals for chronic cases only is discussed, and the particular needs of maternity, of mental, and of infectious cases are not overlooked. There is in the pamphlet no advocacy of any particular policy: it is an impartial statement of prevalent ideas, views, and suggestions. As such, it forms a most valuable, and almost indispensable, basis for further discussion by committees or at conferences which, during the ensuing year, will be considering some or all of these aspects of hospital work with a view to early and practical application.

[1] *Recent Tendencies in the Development of General Hospitals in England.* By Dr. Melville D. Mackenzie. Quarterly Bulletin of the Health Organization of the League of Nations. Vol. iii. Extract No. 8.

PUBLIC HEALTH IN SOUTH AFRICA

Science, it is said, knows no frontiers, and so medicine, as a science, is one the world over. Nevertheless, according to latitude and the like, its occasions differ, and even without passing the frontiers of the British Empire we find the widest variety in the scope and method of its applications. Thus in the Union of South Africa it is, as here, recognized that every medical practitioner should be trained in preventive medicine, and yet the climate and conformation of the country, its racial make-up, and its endemic diseases all raise problems which differ notably from those encountered in England. A work on public health in the Union, issued by Dr. E. H. Cluver[1] at Johannesburg, brings out these points well, and presents a most informative picture of the duties and the opportunities alike of the practising doctor and the medical administrator in that sunny land. The essentials of meteorology, ventilation, lighting, water supply, and nutrition are stated with exemplary clearness. The view is expressed that in South Africa indoor fires are an unhygienic luxury, and the question of plumbo-solvency is treated more in the interests of the water-pipes than of the human subject. The importance of town planning is urged, pre-planning for the growing towns, re-planning for those which have grown awry. Special merit belongs to the section on the prevalent communicable diseases, including the control of typhoid fever, with its H and O agglutinations ; of plague, now enzootic among veld rodents ; of small-pox, which has not been epidemic since 1881 ; and of typhus, which is an endemic infection of the Transkei and Ciskei natives. Rabies is enzootic in the yellow mongoose. Of leprosy there are over 2,000 cases in institutions. Tuberculosis in the mines is ascribed not to silica but to sericite. Malaria prevails along the Natal coast and in the low veld of the Transvaal, and schistosomiasis is widely endemic in the lands drained by the eastward-flowing rivers. Dr. Cluver's book reveals the wide range and interest of medical practice in South Africa. It is intended primarily to meet the requirements of medical and D.P.H. students in the University of Witwatersrand. They could not, we think, be better served. It should make also, as suggested in a foreword by the Chief Health Officer of the Union, a wider appeal to doctors and medical and lay public health workers, who will derive from it sound doctrine and valuable guidance to aid in deciding what course to follow in an hour of stress.

Sir George Seaton Buchanan has been appointed Master of the Society of Apothecaries of London for 1934–5, and Sir William H. Willcox and Dr. J. S. Fairbairn, Senior and Junior Wardens, respectively, for the same year.

We regret to announce the death in Copenhagen, on September 1st, of Professor Carl Olaf Jensen, director of the Danish Agricultural and Veterinary School, whose name is known throughout the world for his researches on cancer.

[1] *Public Health in South Africa.* By E. H. Cluver, M.A., M.D., D.P.H. Johannesburg: Central News Agency. (12s. 6d.)

Nova et Vetera

THE MEDICAL AND MENTAL HISTORY OF DR. SAMUEL JOHNSON

Dr. W. Russell Brain, writing as a physician and neurologist, has contributed to the May number of the *London Hospital Gazette* a valuable paper on the medical history of Samuel Johnson. He calls his essay "A 'Post-Mortem' on Dr. Johnson" and read it to the Osler Club. It is much more than an anamnesis of an autopsy, for Dr. Brain considers some aspects of his subject which could not possibly be discovered after death—aspects which throw a new light on the mentality of one who dominated the literary circles of his generation and yet himself suffered from an inferiority complex.

The main outlines of Dr. Johnson's bodily health are well known. He had tuberculous glands as a child, and Queen Anne "touched" him for their cure. He suffered from such a high degree of myopia as to be practically blind in one eye. He was so hard of hearing that in later life he sat in the gallery at St. Clement Danes as close as possible to the pulpit. He suffered so severely from indigestion that he once wrote to Mr. Hector, whose sister was his first love, "My health from my twentieth year has been such as seldom afforded me a single day of ease." He had more than one cerebral thrombosis, and late in life he had asthma. A post-mortem examination was made in the presence of Drs. Heberden and Brocklesby and Mr. Cruikshank. The record exists, and from it, in the light of modern knowledge, Dr. Brain says:

"The pathological findings would appear to be due to hyperpiesia and chronic heart failure, ischaemic kidneys, chronic emphysema, and cholecystitis. Some writers have assumed that Johnson's asthma was bronchial asthma. This is unlikely, in view of its late onset; and his dyspnoea seems to have been due at first to emphysema and later to 'cardiac asthma.'"

The most interesting and wholly new part of the essay is that dealing with a psycho-analysis of Dr. Johnson, and it gives much food for thought. Dr. Russell Brain, speaking as a neurologist, says:

"Johnson's physical infirmities were probably less distressing to him than his disorder of mind, of which the most obvious manifestations were his remarkable involuntary movements. . . . His gesticulations, like most of his other characteristics, were on a large scale. At times he would hold his hands at his breast in motion 'like those of a jockey at full speed.' He would stretch out his arm with a full cup of tea in his hand in every direction, to the alarm of his immediate neighbours. 'Sometimes,' says Miss Reynolds, 'he would twist himself round with his face close to the back of his chair and finish his cup of tea, breathing very hard, as if making a laborious effort to accomplish it.' He went through complicated manœuvres with his feet, and had to carry out an elaborate ritual of movements before he would pass through any door. Sometimes he would stop in the street to gesticulate. . . . One Sunday morning in Twickenham Meadows his antics caused a crowd to collect. When he sat down by the river they nearly dispersed, but 'he pulled out of his pocket Grotius' *De Veritate Religionis*, over which he seesawed at such a violent rate as to excite the curiosity of some people at a distance to come and see what was the matter with him.

"Another symptom of his mental abnormality was his melancholy, which, in his own opinion, he inherited from his father. He seems to have first suffered from this when at Oxford at the age of 20. . . . He had a particularly severe attack when he was 56. . . . His fear of death was a constant obsession, and was probably the cause of that hysterical outburst of laughter which was aroused by Langton's making his will. He sat up late at night to avoid being left to himself. 'I lie down (said he) that my acquaintance may sleep; but I lie down to endure oppressive misery; and soon rise again to pass the night in anxiety and pain.' Yet Fanny Burney could say of him, 'Dr. Johnson has more fun and comical humour about him than almost anybody I ever saw.'

"What was the nature of his disorder of mind? Was he, as he himself, to Boswell's distress, said, 'mad all his life, at least not sober'? Periodical melancholy, or at least depression, naturally suggests manic-depressive psychosis. Yet there are several reasons for believing that Johnson's depression was not due to a psychosis. The most important is that to a large extent his lowness of spirits could be dispersed by distraction of mind, which leaves psychotic depression untouched. He himself practised distraction of mind as a cure for melancholy, and often recommended it to others. An amusing example of his method is given by Mrs. Piozzi. 'When Dr. Johnson felt his fancy, or fancied he felt it, disordered, his constant recurrence was to the study of arithmetic; and one day that he was totally confined to his chamber, and I inquired what he had been doing to divert himself; he showed me a calculation which I could scarce be made to understand, so vast was the plan of it and so very intricate were the figures: no other indeed than that the National Debt, computing it at one hundred and eighty millions sterling, would, if converted into silver, serve to make a meridian of that metal, I forget how broad, for the globe of the whole earth, the real globe.'"

Johnson's melancholy, like his gesticulation, was a symptom of his severe obsessive-compulsive neurosis, says Dr. Russell Brain, and he concludes a very valuable essay by considering what Freud, Adler, and Jung would have made of Johnson. Freud, he thinks, would fit him in the somewhat Procrustean bed of Jocasta. Johnson's wife, old enough to be his mother, must surely have been a mother-substitute, and Mrs. Williams, Mrs. Desmoulins, and the other queer old ladies with whom he lived in a kind of platonic polygamy would have held a similar position. Adler would regard Johnson as a man of exceptional ability suffering from the fatal psychological handicap of several forms of inferiority; his physical defects of poor vision and facial disfigurement, his lack of comeliness relative to his younger brother, and his hampering poverty must all have been thorns in his flesh when he considered his intellectual capacity and what he might have been had it not been for these handicaps. Jung would classify him in the group of "thinking extroverts."

"In his religion intellectual dogmatism seems to have taken the place of mystical experience, and he was racked by a sense of guilt which made the thought of death an intolerable obsession. . . . Though in no sense a Pharisee, yet psychologically he was a whited sepulchre, without—the Thirty-nine Articles, within—the dead men's bones of pessimism, terror and despair."

Dr. Brain's final picture of Johnson is that of a man of genius, harassed by physical infirmity and mental ill-health, failing to find adequate employment for his talents and satisfaction for his ambitions, yet triumphing over all handicaps and achieving an immortality in human affection that would have been denied to the successful politician or lawyer he might have been.

THE PORT OF LONDON IN 1933

General interest attaches to many parts of the annual report for 1933 of the medical officer of health for the Port of London, the extent of which is from Teddington Lock to the entrance of Havengore Creek in Essex and the Warden Point in Sheppey. The tonnage of entering vessels exceeded that of 1932 by more than 1,239,000 tons. Of the 13,575 vessels arriving from foreign ports 1,600 were inspected by medical officers. No case of plague arrived, and no plague-infected rats were found in any ships or on shore in the Port. Under the new sanitary regulations of 1933 a total of 1,027 certificates were issued in respect of deratization; the paper read last year before a meeting of the Association of Port Authorities by the medical officer of health on the rat-proofing of ships is reproduced. In it Dr. C. F. White indicates the main lines of this work, such as the opening up of pipe casings and the stopping of rat runs. He urges that the correction of rat harbourage should be indicated on certificates by the words "eliminated" or "protected," as the case may be. When harbourage has been really eliminated, the word "none" should appear in the rat-harbourage column of subsequent certificates. The Port of London Authority has issued instructions that all new work is to be structurally rat-proof. Dr. White concludes this section of his report by remarking that, although to some small extent *X. cheopis* fleas are found on ship rats in the Port, it is very rarely that they persist ashore. They certainly

do not multiply on the shore rat population, and if the spread of rodent plague ashore depends on the *X. cheopis* the Port of London should be practically immune from any danger of a rat epizootic.

SHIPS' WATER SUPPLY

Ships usually obtain water from the shore supplies afforded to the docks by the Metropolitan Water Board and the South Essex Water Company, but when no water is available at the berth, or the ship is lying at moorings in the river, the supply is drawn from water boats, of which there are twelve working in the Port. Every care is taken to avoid pollution of all the sources, but in August, 1933, an outbreak of enteritis on a ship in the Mediterranean was traced to the end of a canvas hose attached to a tap on a quay. It was found that samples from the end of this hose, but from nowhere else, contained coliform bacilli, although no true *B. coli* were recovered. It is concluded, therefore, that coliform organisms may gain access to pure water during its passage along a length of hose to a ship, and will, under favourable conditions, multiply during storage in the ship's tanks. These bacilli are not pathogenic, but they indicate the possibility of dangerous contamination. Dr. White adds the caution that in such cases it is important to discriminate between the true *B. coli* and coliform bacilli—a distinction which is not always made. He does not think that bacteriologists should unhesitatingly condemn a sample of water from a ship merely because coliform bacilli are present. Doubt should be expressed about the sample without a final condemnation. Coliform bacilli are probably present in the majority of samples of water from ships, but outbreaks of water-borne disease on shipboard are very rare: he remarks that it is very doubtful whether the outbreak of enteritis in this ship was actually due to the water supply, and that it is certain that the water supplied in the Port of London is above suspicion.

BOARDING OF VESSELS ON ARRIVAL

Dr. White hopes that some day the routine boarding of ships from infected ports will be discontinued, and in its stead there will be boarding of ships carrying cases of infectious disease and also any case of sickness which might conceivably be of an infectious nature, though not actually diagnosable as such. The port medical officer should be the person to carry the responsibility of deciding whether a case might possibly prove to be infectious. Many cases of typhoid fever, some of small-pox, and a few of plague have been landed in this country as "influenza"—a diagnosis which should always be regarded with suspicion by every medical officer. When a ship arrives which has on board a case of one of the major infectious diseases, or on which such a patient has died or has been landed abroad within the incubation period of that disease, it is the practice to regard every person on board as a contact and to arrange for his supervision. Those intending to leave the ship are required to give their names and future addresses before leaving, for it has been found useless to extract this information from the passenger manifest and the crew's articles. The introduction of a double postcard, one half for the notification of the immediate address and the other for notification of any change of address, has proved very successful in expediting the clearing of ships and the transmission of the necessary information to the medical officers of health of the districts of destination, and in making passengers realize their obligations under the regulations. The section for notifying change of address is on the "business reply card system," so that the passenger need not stamp it. The efficiency of the system was indicated by an instance when 289 such cards were issued and only one address could not be traced.

The Treasury has recently made, on the recommendation of the Advisory Committee, the Additional Import Duties (No. 28) Order, 1934 (S.R. and O., 1934, No. 921), under which the Customs duties on medical, surgical, dental, veterinary, and dissecting instruments and parts thereof will, as from August 25th, be at the rate of 20 per cent. ad valorem.

THE TWELFTH INTERNATIONAL VETERINARY CONGRESS

This was held in New York during the week beginning August 13th, under the presidency of Dr. JOHN R. MOHLER, chief of the United States Bureau of Animal Industry. It was attended by approximately 3,000 delegates from about sixty different countries—nearly twice as many as had attended any previous congress. This is the first occasion it has taken place in America, the last congress, as readers may recall, being held in London in 1930 (see *Journal*, August 16th, 1930, p. 259). During the course of the congress many topics relating to medicine and comparative medicine were discussed, and we give below a selection of those of more immediate medical interest.

ANTHRAX

On Monday afternoon (August 13th) Dr. MARIO MAZZUCCHI (Italy) described his new method of vaccinating animals against anthrax. This method aims at localizing bacilli with a certain degree of virulence at the site of inoculation and attaining the slow absorption of an antigen with a high immunizing power. To do this he injects the organisms simultaneously with saponin ("carbozoo" vaccine) in order to bring about a gelatinous oedema around the injected bacilli. In sheep an immunity is still noticeable five months after vaccination, although this immunity is not observable before the ninth or tenth day. He claimed that this method of vaccination was a harmless and effective means of clearing up enzootic hotbeds of the disease, over two million animals having been treated in Italy alone in this way. Dr. VIDAL MUNNE (Spain) believed that immunity in this disease was possible only when the bacteria reproduce at the site of inoculation and there form capsules, and he concluded that intradermal inoculation is most efficient.

INFECTIOUS MASTITIS

Professor STECK (Switzerland), on the same afternoon, introduced a discussion on infectious mastitis. He held that the disease in cattle could be effectively controlled only by eliminating infected animals (by fattening and slaughter), by separation of all less seriously infected animals, and by chemotherapy to minimize the spread of the infection and shorten segregation. He believed that the repeated use of antiseptics such as the acridine derivatives gave an efficacy of over 90 per cent. Dr. MINETT (Royal Veterinary College) discussed streptococcal mastitis from its bacteriological and preventive medicine viewpoint. The disease was mainly caused by *Streptococcus agalactiae*, although two strains of haemolytic streptococcus were sometimes also involved. The latter were very similar to the human *Streptococcus pyogenes*. As a rule they did not cause disease in man, although human strains were occasionally seen in mastitis and were especially dangerous. The disease could be effectively controlled by milking infected cows last. Dr. SVEN WALL (Sweden) discussed mastitis due to *Diplococcus schütz*, and Professors CHRISTIANSEN and NIELSEN (Denmark) considered the methods by which cattle became infected. They concluded that under natural conditions this was always by the teat canal, although they admitted that some undiscovered factors existed which governed the entrance of the bacteria. Drs. JONES and LITTLE (U.S.A.) agreed. Their experiments indicated that the udder became sensitized by one or more preliminary infections which did not result in disease.

VETERINARY SANITATION

On Tuesday morning (August 14th), at a general session of the congress, a paper by Professor LECLAINCHE (France) was read on State veterinary sanitation. The old methods which had already conquered—at least partially—many important diseases, such as glanders, rabies, anthrax, and various others, were insufficient against such widespread infections as tuberculosis, Bang's disease, and so on. Eradication of these was at present impracticable, and it was sought instead to limit the losses to a supportable

economic total. He expressed himself in favour of using only healthy stock to build up herds and to replace unprofitable animals, and advocated the issuing of State certificates of health, which would guarantee not only that the animals were free from disease themselves, but that they came from healthy herds. He opposed hasty methods of eradication as likely to lose the confidence of the stock owner. At the same session Dr. MOHLER, chief of the Bureau of Animal Industry (U.S.A.), discussed the relation of veterinary science to animal breeding and public health. In connexion with the latter he stressed the importance of meat inspection and of veterinary supervision of animals at the time of slaughter, of improvement in milk supplies, and of the value of research on animal diseases in providing information of value for the betterment of mankind.

PSITTACOSIS AND WEIL'S DISEASE

On Tuesday afternoon Professor MEYER (U.S.A.) discussed the 1931 outbreak of psittacosis, which took place in parakeets in California. The casual agent was a filterable virus, transmissible to a number of other species of birds and to man. Since 1929, 143 human cases had been definitely diagnosed in North America. United States health regulations now required certificates of health and other precautions to be taken before parakeets were transported anywhere. At the same session Dr. KLARENBEEK (Holland) drew attention to the frequency of Weil's disease in dogs in Holland, and its importance in these animals, because of their intimate association with man. It was the more important on account of the difficulty of diagnosis in the dog and the variability of the symptoms which it caused.

TUBERCULOSIS

On Wednesday morning (August 15th) Dr. E. A. WATSON (Canada) introduced a discussion on tuberculosis. He had studied the B.C.G. method of vaccination over a period of ten years in a dairy herd of ninety cattle, fifty-four of which had been vaccinated, thirty-six acting as unvaccinated controls. All were equally exposed to natural infection, and on necropsy the incidence of tuberculosis was exactly the same—83.4 per cent.—in both groups. The anatomical distribution of the disease was similar in both groups, but in the vaccinated animals the lesions tended towards caseous, caseo-purulent, and exudative processes, with appreciably less fibrosis than in the unvaccinated group, in which caseo-calcareous lesions predominated. The critical age was between puberty and maturity—that is, 2 to 4 years in cattle—when the increased relative resistance attributable to B.C.G. vaccine was seen to fail rapidly and to disappear. Dr. GUÉRIN (of the Pasteur Institute, France) said that since the last congress in 1930 no fresh observations had been made which would give rise to the hope that a new approach to the problem of tuberculosis prevention in cattle might finally be found, and our two conceptions of prophylaxis were still based on (1) the use of tuberculin and (2) the production of a state of allergy. He believed that the production of an allergic state by the use of B.C.G. furnished a resistance to subsequent infection with virulent tuberculosis, and that it was of great value in controlling the disease. He considered that it was useless to try to eradicate the bacillus, and that we must aim at preventing its effects; further, that we must give up the idea of slaughtering all animals reacting to the tuberculin test, and concentrate on producing resistance to the disease. Dr. WIGHT (U.S.A.) described the campaign to eradicate tuberculosis in the United States, and stated that about 65 per cent. of the cattle in that country were now under supervision. Already 130 million tests had been made, and three million reactors had been destroyed. Dr. ZWICK (Germany), while expressing admiration of the American work, did not believe that it was practicable in Europe. In Germany they used the Ostertag plan, which aimed at the elimination of contagious cases. That this system was valuable was beyond doubt. He considered that the B.C.G. vaccine was still in its experimental stage, and stated that the tendency in Germany was to be cautious. Professor BASIL BUXTON (Cambridge) described the Cambridge experiments on B.C.G., which were commenced in 1927 and were still continuing. These results indicated that the vaccine could raise the resistance of a calf to a virulent experimental infection. The degree of resistance varied considerably, and appeared as a rule to be directly proportionate to the dose of vaccine. Experiments were now in progress to ascertain whether repeated vaccination at proportionate intervals over a period of years would maintain the resistance of cattle to reinfection with virulent bacilli.

IMMUNITY TO PARASITES

On Wednesday afternoon Professor T. W. M. CAMERON (McGill, Canada) discussed the question of immunity against animal parasites. He believed that the resistance mechanisms of the body against animal parasites did not differ in principle from those evoked against bacteria and viruses, but their method of attack was so different that their manifestations were often altered considerably. Our present knowledge of the subject was still fragmentary and confusing. It seemed possible, however, to summarize our existing knowledge in the following terms. Animals were *naturally immune* to parasites of physiologically unrelated animals, although a few worms appeared to have very wide physiological requirements—for example, fasciola, trichinella, and the larval stages of echinococcus. In certain circumstances natural immunity may be broken down. Animals were naturally *tolerant* to the effects of their own parasites, but this tolerance could easily be broken down by adverse factors. They were much less tolerant to abnormal parasites. Animals often become *premune* to their own parasites; this premunition might be broken down by unnatural factors such as lack of food, overcrowding, other parasites, and so on. This was a common method of resistance to protozoa; we were less sure of its operation against metazoa. Animals were sometimes susceptible to parasites proper to physiologically related animals; an age resistance was often shown to these as it was to other abnormal or recently introduced species. The evidence for breed immunity was still very scanty. There was little evidence yet of a true *acquired immunity* against adult helminth parasites, and, although theileria produced a sterile immunity and the coccidia might do so, premunition was, in general, the usual means of resistance among the protozoa. In practice an artificial premunition can be produced only against babesia. It seemed probable that hypersensitiveness was a normal defence reaction of the body. The phenomenon had been successfully used in diagnosis. Some of the serological changes observed appeared to have no necessary connexion with defence reactions, but some had. There was no evidence (with the doubtful exception of sarcocystis) that any of the animal parasites produced a true toxin, and the "foreign proteins" introduced by them into the body were probably normal secretions and excretions. If antibodies produced in response to normal secretions inhibited their actions, they might well prevent parasites from securing and digesting food, and consequently act as a mechanism of resistance. Other antibodies, especially in the protozoa, acted by interfering with reproduction, possibly in a somewhat similar way. The eosinophils, evoked in response to the presence of foreign proteins, seemed to play an active, but as yet improperly understood, part in the defence against metazoan parasites and their effects.

MILK MARKETING

On Thursday morning (August 16th) Dr. VON OSTERTAG (Germany) introduced a general discussion on the marketing of milk. As wholesome milk, he declared, could only be derived from healthy cows veterinary milk control was essential. Milk must not be marketed from cows with udder or "open" tuberculosis, but the question of the transmissibility of Brucella through milk required further investigation. Milk should not be considered dangerous in cases of European mastitis caused by *Streptococcus agalactiae*, in contrast with American mastitis caused by *Streptococcus pyogenes*; it was sufficient to exclude milk which had undergone changes. Milk from animals infected with one of the paratyphoid enteritis organisms must receive particular attention, owing to the dangers of human infection.

VIRUSES

At the same session Dr. MANNINGER (Hungary) introduced a discussion on filterable viruses, which he considered should be called "ultra-viruses," because of a filterable phase in the life cycles of some bacteria. They could be grown *in vitro* only in the presence of living cells—especially active cells. For the most part they caused exceedingly contagious diseases, although a few did not, and many gave rise to cell inclusions. Dr. GERLACH (Austria) commented on their striking resemblance to true enzymes and the unique position they held with regard to their antigenic behaviour. Viricidal power might be demonstrated almost regularly in their antibodies, and it was possible that these were closely related to the antitoxins and antiferments. After recovery from disease the supervening immunity might be of long duration and high titre.

CONTAGIOUS ABORTION

In a discussion on Brucella disease which followed Professor BANG (Denmark) declared that in northern Europe only *Brucella abortus bovis* had been demonstrated in human undulant fever, and that as the bacilli do not multiply in the milk after it is drawn from the udder, mixed milk will usually contain only a small number of the organisms. Dr. COTTON (U.S.A.) described a nation-wide plan in America to reduce the condition by testing and slaughtering reacting animals. Dr. FINZI (Italy) discussed the desirability of standardizing the biological tests for the organism. He believed that there was a future for chemotherapy in the fight against Brucella infections, and that while live vaccines were dangerous dead vaccines were almost useless.

ANIMAL PARATYPHOID AND PUBLIC HEALTH

In the afternoon Dr. CLARENBURG (Netherlands) opened a discussion on the paratyphoid diseases of animals in relation to public health. Complete absence of danger to man could not be claimed for any of the animal salmonelloses, and any meat from any animal harbouring the organisms was potentially dangerous, as well as infected milk and eggs. He advocated compulsory notification of salmonelloses of animals, and minute differentiation of Salmonella occurring in man and animals. Dr. MURRAY (U.S.A.) and Dr. STANDFUSS (Germany) discussed the classification of the group in some detail, based on their reactions in various carbohydrate media.

France

[FROM OUR CORRESPONDENT IN PARIS]

The late Professor Léon Bernard

An international as well as a national leader of medicine has been lost in Léon Bernard, professor of tuberculosis at the University of Paris. His conception of a holiday was change of work, preferably in moving about from place to place, inspecting in France the many tuberculosis activities with which he was connected. A serious motor car accident a few years ago arrested his zeal only momentarily, and he was in the full exercise of all his faculties when, in the latter half of August, at the age of 62, he was admitted to a nursing home in Clermont-Ferrand on account of a dental abscess whose evolution proved fatal in a day or two. Médecin des Hôpitaux de Paris, Léon Bernard succeeded Chantemesse in 1919 in the chair of social hygiene in the Faculty of Medicine. Subsequently, he became clinical professor of tuberculous diseases. He was president of the Conseil Supérieur de l'Hygiène Publique, and the permanent delegate of France on the Health Committee of the League of Nations. His publications covered a wide range, and some of the most important were those concerned with public health. Holding a commanding position at the Laennec Hospital in Paris, he extended his tuberculosis activities throughout France, and was the chief promoter of the Cité de Clairvivre—the French equivalent of Papworth. He was also the originator, as well as the chief administrator, of the Colonies de Placement Familiale des Tout-Petits—a system for the removal of the newborn child from its tuberculous mother to healthy surroundings. Léon Bernard was a member of the Permanent Committee of the Office International d'Hygiène Publique, secretary of the International Union Against Tuberculosis, and adviser to the League of Red Cross Societies, to whose successful birth he contributed not a little at the Cannes meeting in 1919. Though he was best known as a clinician and administrator, his qualities as a laboratory and research worker were rated so highly by the authorities that, at the time of Roux's death, there was serious talk of Léon Bernard being asked to succeed him as head of the Pasteur Institute.

New Street Accident Hospital in Paris

In the past a goodly proportion of the street and other local casualties found their way to the old Beaujon Hospital, in which President Doumer died after being shot on May 7th, 1932. The Beaujon is now to have a successor in a less central part of Paris, and its emergency activities will be taken over by a small new public hospital to be devoted exclusively to street accidents. There are to be only forty-seven beds for such cases, and the hospital will be given the name of Fondation Paul-Marmottan in commemoration of its principal benefactor. The building will be one of four stories, the first three being for the accommodation of the patients themselves and for a radiological service. On the fourth floor there will be accommodation for operating theatres and for services ancillary thereto.

England and Wales

The British Post-Graduate Hospital and Medical School

The new buildings at Hammersmith are rapidly approaching completion. A priced schedule of equipment for all purposes was prepared some time ago, the estimated expenditure therefor amounting to £52,800, exclusive of sterilizers and certain constructions which had to be obtained, at an estimated cost of £1,450, as the building works proceeded. The total estimated cost for works and equipment is £198,000. It is thought that it would be a very complicated and difficult matter to determine, in accordance with the terms of the agreement entered into last year between the London County Council and the Corporation of the School, what equipment is required for the use of the hospital separately, and for the use of the school separately, particularly as a certain amount of equipment will be used by the hospital and school jointly. The equipment for the purposes of the hospital, having regard to the post-graduate teaching which is to be given therein, is necessarily on a more extensive scale than would ordinarily be required at a Council hospital; on the other hand, the superior equipment of the school will be to the hospital's advantage. It is therefore proposed

that the cost of the whole of the initial equipment shall be divided equally between the two parties, as has been done in the case of the buildings. Various developments are taking place at Hammersmith Hospital in anticipation of the establishment of the school. When the block containing the new labour rooms is opened additional maternity beds will be required, and these are to be obtained by the adaptation of a ward in another block to provide for seventeen maternity cases. Accommodation will also be provided for twelve cots, with a bathing bay and sun balcony. Additional isolation accommodation will be necessary, to be obtained by the adaptation of a single-story block hitherto used for maternity purposes, with accommodation for a nursing staff of five. It is also proposed to fix glazed sliding sashes to the six sun balconies so as to provide adequate fresh air and protection from the weather. The hospital formerly had only one entrance, but a new entrance, with a roadway for all goods traffic, is being constructed at its western boundary. As already announced, it is intended to make provision for a radiological department at Hammersmith which shall be a consultative centre for the whole hospital service of the L.C.C. To this department cases will be sent from other hospitals for expert opinion on diagnosis and treatment. The officer in charge, whose salary will be £1,500 a year, will be designated "Director of the Radiological Department of Hammersmith Hospital and Consulting Radiologist to the Council's Hospitals."

Medical Society of London

The first half of the session 1934–5 of the Medical Society of London will open on Monday, October 8th, with the annual general meeting at 8 p.m., followed by Lord Horder's presidential address on "Medicine and Morals," at 8.30 p.m. On Monday, October 22nd, at 8.30 p.m., a discussion on the anaemias and their treatment will be introduced by Dr. Leslie Witts. A clinical evening will be held on Monday, November 12th, at 8 p.m. A discussion on the value of accessory methods in the diagnosis of intracranial tumours and allied conditions will be opened by Mr. Hugh Cairns on November 26th, at 8.30 p.m. On Monday, December 10th, at 8.30 p.m., Dr. H. Graham Hodgson will introduce a discussion on the future of diagnostic radiology. The Lettsomian Lectures will be delivered by Mr. J. E. H. Roberts on February 18th and 27th and March 4th, 1935, at 9 p.m. Sir William Willcox will deliver the annual oration on Monday, May 13th, 1935.

Residential Treatment of Tuberculosis

For many years the London County Council has published after-histories of patients who have received residential treatment for tuberculosis under its scheme. The latest particulars relate to the number of survivors of those who received treatment and were discharged in 1928. The number of adult patients discharged from institutional treatment during that year was 4,867, in 290 of whom the diagnosis of tuberculosis was not confirmed, and of the remaining cases the subsequent history of 437 cannot now be traced. Of 766 early cases 71.8 per cent. have been found to be alive after the five-year interval, of 2,149 moderately advanced cases 34.6 per cent. have been found to be alive, and of 960 advanced cases 4.7 per cent., while of 261 surgical cases 75.8 per cent. were surviving. During the same year (1928) the number of children discharged from residential institutions after having received at least one period of residential treatment was 938. In 171 cases the diagnosis of tuberculosis was not confirmed, and in eighty-six others reports were not available. Of 148 early pulmonary cases 12.2 per cent. were dead after five years, of thirty moderately advanced cases 63.3 per cent. were dead, and of twenty-eight advanced cases all were dead. The proportion of deaths, after five years, in 475 surgical cases was 5.9 per cent. The London County Council is proposing no longer to require contributions towards the cost of the residential treatment of tuberculosis from patients or persons legally responsible for them. In the opinion of the Hospitals and Medical Services Committee the requirement is neither sound in principle nor desirable in practice. In fact, less than 30 per cent. of the cases treated have been so assessed, and the sums collected annually in recent years have been about £11,000, while the cost of collection has been £1,800. It is pointed out that it has been a principle in connexion with the assessments for tuberculosis in the past that regard should be paid to the importance, on medical grounds, of maintaining the standard of living of the family. Tuberculosis is a disease in dealing with which it is vitally essential that nothing should be done which might give cause for financial worry or anxiety to the patient or patient's family during treatment, or be likely to lower the resistance of the family to disease. It is, moreover, a disease specially liable to recur, and the heaviest mortality among tuberculosis patients occurs during the first four or five years after discharge from institutional treatment. It is very necessary that employment undertaken by ex-tuberculosis patients should be suitable, and that they should not be forced by financial circumstances to take unsuitable employment. It is added that there is no desire that the discontinuance of assessments should in any way affect the carrying out by Care Committees of their primary and important functions with regard to the tuberculous. The new Council appreciates greatly, as its predecessors did, the services rendered by voluntary workers on the Care Committees and by the officers of the borough councils associated with the work.

Coroners' Inquests in London

During 1933 the number of deaths reported to London coroners was 8,533, an increase of 173 on the figure for 1932. Of these 3,025 took place in mental hospitals and other institutions. The coroners held inquests in 3,543 cases and directed post-mortem examinations in 2,896 of these cases, as well as in 2,962 of the other cases in which no public inquiry was necessary. A verdict of murder was returned in seven cases and of manslaughter in two. The total number of suicides was 760, an increase of forty-one on the year. Three inquests were held in connexion with executions. Deaths from want of attention at birth decreased from forty to twenty-eight. The number of people who met their death by accident was 1,965, as compared with 1,892 in 1932. Injuries accounted for thirty-two deaths, and there were fifty-four deaths by drowning. A verdict of "Death from natural causes" was returned in 504 cases, and there were seven verdicts of "Cause of death unknown." Inquests on newly born children decreased from sixty-seven to forty-four, and verdicts of murder of the newly born were returned in only two cases. Excessive drinking accounted for fifty-three deaths, as compared with fifty-four a year ago.

Fire and Explosion Risks in Operating Theatres

The London County Council has asked the Minister of Health to consider the desirability of an investigation being made into fire and explosion risks in operating theatres due to the use of modern anaesthetics and electrical appliances, with a view to the formulation of effective safety precautions. Until such time as an authoritative decision on the matter is available, the practice of requiring that switchgear provided in registered nursing homes shall be of the highest standard commercially obtainable will be continued.

Salaries of District Medical Officers

Last year the London County Council fixed provisional salaries to be attached to certain positions of district medical officer, but statistics now available as to the work in the new medical relief districts show that in certain cases the provisional salaries are not commensurate with the amount of work the officers have to undertake. From October 1st next, and until the whole question of the district medical service is reviewed, the salary will be increased, in three districts by £35, in six by £50, in one by £75, and in one by £110.

Hull Royal Infirmary

During the past five years the work of the pathological department of the Hull Royal Infirmary has more than doubled, and in the annual report of this institution for 1933 it is announced that certain alterations and extensions have consequently had to be effected at a cost of over £850. The permanent appointment of an assistant pathologist is also recorded. The efficiency of the *x*-ray department has been increased by structural alterations and the provision of a new dark room. Other new staff appointments rendered necessary by the increase in the work of the Infirmary include that of a third honorary physician to relieve the strain imposed by the opening of the Sutton Branch, and of a resident surgical officer to co-ordinate this side of the work. There was an increase in the number of in-patients treated during the year under review, establishing a new high record for the Infirmary. As regards the associated activities, it is reported that a preliminary training school has been opened in order that probationer nurses may receive some preliminary instruction before taking up ward duties. This innovation has proved to be valuable to the institution as well as to the students. In order to help out-patients who would normally have to attend daily at the Infirmary for dressings, and for whom the journey would have been a hardship owing to distance or home conditions, the executive committee of the Hull Jubilee District Nursing Association made arrangements during 1933 for their nurses to attend such patients in their homes. In this connexion it may be noted that there was a marked decrease in the number of out-patients treated at the Infirmary in 1933 as compared with 1932, though the number of casualties treated increased. An arrangement has been made with the Hull Incorporated Law Society whereby patients admitted as the result of accidents, and who express a desire for legal advice, are put into touch with local solicitors on the society's rota. The service is not necessarily free, but where it is found, on investigation, that a patient is not able to pay for the legal aid required, the case is passed on to the Poor Man's Lawyer Committee of the Hull Community Council. The main object of the scheme is to prevent patients from getting into the hands of touts, and it is also hoped that where the Infirmary is legally entitled to payment for maintenance (as in certain cases under the Road and Rail Traffic Act) the new arrangement will be of value in securing a speedy and satisfactory settlement in this respect. Another arrangement with the Hull Community Council provides that the council's social service secretary shall act as part-time almoner in the case of patients needing after-care treatment and advice. A Samaritan fund has been brought into being for helping indigent patients who require such accessories as special appliances. In the year under review there was an excess of ordinary expenditure over ordinary income of nearly £7,000; not since 1928 has there been a year when ordinary income equalled expenditure, and the accumulated deficit since that time now amounts to more than £23,000. Several large special donations were received, however, during the year, and various voluntary committees have rendered generous help.

Scotland

Housing Amenity in Scotland

The Secretary of State for Scotland has set up an advisory committee to the Department of Health to consider how architectural quality and amenity may best be incorporated in the layout, planning, and external treatment of houses for the working classes in both town and country, and to consider whether higher tenements than have hitherto been accepted should be permitted. The chairman of the committee is Mr. J. R. Richmond, C.B.E., director of an engineering firm in Glasgow, and the members include a number of prominent Scottish architects and surveyors. It is hoped that the work will lead to improvement in the general amenity and quality of buildings to be erected, especially in places where clearances are to be made and where it is desirable to rehouse as many of the dispossessed dwellers as possible in sites near their work. It is proposed that new tenements shall follow the present Continental models, with balconies, gardens, and possibly roof-gardens. The new scheme is part of the Government's housing plan, under which it is estimated that some 200,000 houses are still required in Scotland.

New Scottish Hospitals

The Aberdeen Town Council has approved the erection of a special block in the new Aberdeen Royal Infirmary buildings, Foresterhill, for the treatment of diseases of the ear, nose, and throat at an estimated cost of £60,000, as part of the Joint Hospital Scheme, for which a sum of £400,000 was subscribed. The Public Health Committee of Dunfermline Town Council has recommended a site at St. Leonard's, on the south side of Dunfermline, for the erection of a new maternity home and hospital. The accommodation in the present hospital, which has been successfully managed by the Corporation for some years, has recently been found insufficient for the number of patients applying for admission. It was intimated at a meeting of Peterhead Town Council that a gift of £5,000 had been received from Mr. William Shewan to provide a hospital for the town. A condition of the gift was that within five years a suitable hospital should be established and equipped.

Pithead Baths in Fife

Pithead baths, which have been erected at a cost of £13,000, provided by the Miners' Welfare Committee, were opened at the Aitken Colliery, Kelty, on August 23rd, by Dr. T. G. Nasmyth, Edinburgh, senior director of the Fife Coal Company, to which the Aitken Colliery belongs. The baths are the second largest in Scotland, accommodating 912 men. Dr. Nasmyth said that the provision of pithead baths was one of the best sanitary reforms of recent years, and it was satisfactory that this matter was being dealt with all over the mining areas of the country.

Mr. J. B. Priestley and Mr. G. L. Stampa have collaborated in the preparation of an impressive foreword to an interesting little book issued by the Anti-Noise League of 18, Old Cavendish Street, London, W.1. Mr. Priestley, who confesses to having written the article while his ears were stuffed with cotton-wool in a vain attempt to secure a reasonable degree of silence, laments that "hardly anybody is busy inventing quietness." The book reveals that the Anti-Noise League, of which Lord Horder is chairman, has already accomplished a good deal of useful work during the ten months of its existence. It appears that the League was largely instrumental in securing the new Road Traffic Act provisions for silence zones in which hooting at night is prohibited and the placing upon manufacturers of the responsibility for fitting effective silencers to cars.

CORRESPONDENCE

Medical Education

Responsible Clinical Experience

SIR,—While a member of the Education Committee which has now reported to the Council and the Representative Body, I gave my support to what may be described as the main objective of the committee—namely, that the medical graduate should have the benefit of a period of responsible clinical experience before taking up the duties of public practice—I differed, however, from the majority of the committee as to the means of achieving this objective. As I was assured by the Chairman that an expression of individual opinion in the *Journal* would be considered by him a proper proceeding, even though it was at variance with the recommendations of the committee, and believing that the particular point of difference is an important one, I desire to put my alternative proposal on record.

The committee's recommendations achieve the end in view by:

1. Compressing the organized institutional tuition into a period of four years and three months.

2. Requiring the student, still a pupil and unlicensed to practise, to employ the remaining nine months of the five years' curriculum in some responsible clinical appointment.

My alternative proposition was:

1. To leave the period of organized institutional tuition unchanged (that is, five years), and to admit the student to the *Medical Register* at the end of this period.

2. To require from every so registered medical practitioner a period of one year in a responsible clinical appointment before a licence for *independent* public practice is granted to him. I proposed that this year should be spent either as a resident in hospital or as an assistant in general practice, or as both, according to the intentions of the individual practitioner.

The committee was influenced by two important considerations—that the curriculum should not be lengthened and that its expense should not be increased. Both requirements are met by both of these alternative propositions, but in my view my own alternative is the better in that:

1. It avoids the further compression of an already overburdened curriculum.

2. It avoids all the difficulties incident to the responsible and comprehensive employment in hospital or in general practice of an unregistered practitioner.

3. It ensures, in a simpler way, the two main requirements—adequate theoretical instruction and an adequate training in the public application of that instruction.

It is impossible to discuss details in a letter, and I must content myself with pointing out that the practitioner registered under the alternative scheme, but not independently licenced, would be worth a salary to a general practitioner or to a hospital sufficient to keep him, whereas the general practitioner and the hospital would have great difficulty in finding employment for a fifth-year student: the responsibilities which could be entrusted to him would be limited. Admitted that this difficulty might be evaded by an alteration in the "covering" regulations of the General Medical Council, but it is questionable whether the alterations which would be necessary are desirable.—I am, etc.,

London, W.1, Sept. 2nd. K. W. MONSARRAT.

Occupational Therapy

SIR,—Before the correspondence with the above heading is closed I would like to add my testimony to the great value of wisely directed work for cases of mental illness, especially when this is selected and organized under medical control. To be wisely directed, it must not be pressed to the point of fatigue, it must have the concurrence of the patient, and it must not appear to be an attempt to secure an equivalent return for treatment. It must also be regarded as wholesome and beneficial exercise for the individual concerned.

At the recent annual meeting of the Royal Medico-Psychological Association in Northampton, several members—who were entitled by personal experience—spoke of the necessity of work in the interests of health, happiness, and the welfare of the patient; but there was a general feeling that the euphuistic terminology of "occupational therapy" was no new treatment in mental hospitals. The same paper was also read in London at the annual meeting of the Society for Promoting Mental Hygiene, which further demonstrates the importance of the subject. The physiological effect of occupation as exercise is evident in the quickening of the circulation, the aeration and purification of the blood in the expanding lungs, an improved appetite and digestion, and the general tranquillity of the patient through the refreshing sleep that follows. The psychological effects noted are a keener observation, a help to fix the attention—and therefore a distraction from delusional states—the correction of undesirable habits, the encouragement of self-control, and an increase in the skill of the worker. There can be great delight in muscular exercise and an added interest can be kindled in the production of others, whose good opinion is shown in return, and this acts as a further incentive to effort. Your recent contributor (Dr. A. J. Brock, August 25th, p. 375) adds other incentives to "occupational therapy"—namely, self-expression and the satisfaction of creative striving—which offer further inducements.

In my early experience at Claybury, the first asylum of the first L.C.C., opened in 1893, the patients were infused with as lively an interest as the staff in evolving order out of chaos: new roads were made; the grounds and drives were planted and the gardens laid out by the voluntary help of patients. Many scores of standard rose trees were budded by patients and flower borders arranged and afterwards tended with gratifying results upon the recovery rate. In the last years of my administration, during the war, the L.C.C. extended "occupational therapy" by undertaking the manufacturing, in the asylum workshops, of munition shells for artillery guns, under the direction of the late engineer (Mr. W. C. Clifford-Smith). Many hundreds of steel shells were turned out and taken to Woolwich to be charged with explosives for the front. This is, I believe, the first public statement that munitions were made in an asylum, and probably it is a unique record. Finally, I would like to add that the corridors and workrooms still bear evidence of the aesthetic decoration of the walls by "occupational therapy."—I am, etc.,

Plâs Dinas, Carnarvon, Aug. 28th. ROBERT ARMSTRONG-JONES.

Is High Blood Pressure a Risk?

SIR,—With reference to your correspondent's letter of August 25th (p. 370) I give the following experiences. I was once asked to examine lives for a certain insurance company. On my first visit two young men presented themselves, and both had systolic blood pressures in the vicinity of 150 mm. Hg. The next day the manager of the office and his worthy henchman assured me that my examination was unsatisfactory, as the blood pressure

readings were too high and would preclude their acceptance.

I must say that I had been provided with a sphygmomanometer by the company, and I was expected, though I did not then know it, to use the stethoscope method. This I did not employ, reading the instrument, which was an aneroid, when the pulse could no longer be felt. The manager forthwith blamed my "wrong methods" for the wrong readings. After some unpleasant discussion I indicated that perhaps his sphygmomanometer was wrong, since it was an aneroid. He repudiated this suggestion on the grounds (1) that it was the best possible make, and (2) that it had been recommended by a certain consultant. Not being intimidated by either (1) or (2), I forthwith took the sphymomanometer to a near-by instrument maker, where, with the aid of a "Y" connexion, I calibrated the aneroid against a mercury manometer. At about 150 mm. Hg the aneroid was exactly 11 mm. too high! Knowing the frequency with which aneroids are used and the trust with which physicians year in and year out use them for blood pressure readings, it is to be expected that many are badly out of calibration and their readings worthless.

In general practice I frequently come across cases of men and women (more often the latter) in whom the blood pressure has been very high for years and whose readings are more often in the neighbourhood of 300 than 200 systolic. I have one patient who has been in this state for the past seven years and is apparently none the worse. So much is this the case that I habitually tell a good and deliberate lie to patients as to what their pressures really are. Statistical investigations doubtless prove high blood pressures to be dangerous, but when it comes to a given patient there is no criterion whereby to judge the prognosis.

Average results are the bane of medicine and utterly useless to the individual, and as for insurance companies, anyone who has followed the trend of medicine for the last twenty years knows that, like the law, they are asinine.—I am, etc.,

Glasgow, Aug. 29th. THOMAS ROBERTSON.

The Swab in Diphtheria Diagnosis

SIR,—May I direct attention to a method I have found convenient during the last twenty-five years. It was, I think, originally suggested by Hewlett. Assuming a visit late at night to a doubtful case, when one may not have an outfit for taking a swab at hand, a hard-boiled egg is almost always obtainable. This provides, in my experience, a reliable culture medium. An incubator is not essential; the inoculated egg may, for example, be kept near the hot-water cistern. The culture can be examined the following afternoon, and very valuable time saved.

It would be too much to expect the average practitioner of the present to make his own diagnosis in this way, but why should the average practitioner of the future not do so?—I am, etc.,

Manchester, Aug. 29th. J. STAVELY DICK.

SIR,—With regard to the negative swab in cases of true diphtheria, perhaps an experience of mine in 1929 may be interesting.

I was called on August 5th to a case of nasal catarrh, and, being suspicious, took a swab: result, negative. A fortnight later I sent another with the same result. Four further cases, which had been in contact with the original, developed bad throats—swabs of all were negative. I injected all cases with 20,000 units of diphtheria antitoxin, and asked the county medical officer of health to come and inspect, as I was certain they were cases of diphtheria. Both county medical officers came down and took swabs. Some were sent to London and some to Exeter: result, negative to diphtheria, but the pneumococcus was found. Not until October 29th did I get a swab positive to diphtheria. Two patients died in a few days, and the eldest sister died of complete paralysis.

It appears to me that the pneumococcus has an inhibiting effect on the growth of the Klebs-Loeffler bacillus, either *in situ* or on cultivation. When I have had a report of streptococcus I have never had diphtheritic symptoms develop.—I am, etc.,

Lynton, North Devon, Aug. 22nd. ARTHUR P. CUMMINGS.

SIR,—In view of recent correspondence on swabbing throats in diphtheria, my last three cases bearing on this question serve to illustrate the difficulties from the general practitioner's point of view.

1. A young labourer presented himself at surgery with some slough on right tonsil. Not ill in himself, but had been home two days. I labelled him septic throat, did not give serum, but swabbed him. Two days later throat was quite clear of slough, and I told him he could return to work. Five minutes after he had left surgery I received result of swab by 'phone—positive! As he had a family of young children I had no alternative but to send him to isolation hospital. Four days later he was discharged with two negative swabs and "not clinically diphtheria" (with which, of course, I could only agree).

2. Ten days later I was called in to one of his children, suffering from "clinical diphtheria." I isolated her at home, gave 24,000 units, and swabbed. On receipt of positive result I sent her to hospital two days later.

3. A young married woman, with what I considered typical clinical diphtheria: I sent her into hospital straightway. Seventeen days later she was discharged with the report, "Not diphtheria, but septic throat."

In theory, Nos. 1 and 3 should not have been sent to hospital, and No. 2 should have been admitted at once! Nevertheless No. 1 probably was a carrier, and possibly gave it to No. 2, who perhaps did not suffer much by delay in admission, as she got her serum immediately. Cases like No. 3 make one chary next time of sending a case straight into hospital.

It is quite obvious from the correspondence on this subject that I am not the only G.P. who could sign himself

August 28th. PERPLEXED.

*** Readers are referred to the annotation on this subject at page 476.

Typhus in the Tropics

SIR,—In the *Journal* of August 18th (p. 320) I notice a statement in the report of the discussion on typhus fevers in the Tropics which, if not amplified, may give rise to misunderstanding. Dr. J. L. Gilks is reported as having said that the first description of typhus in East Africa was given by himself in 1920. This is correct as far as it goes, but I am sure that Dr. Gilks does not mean it to be understood that he was the first to recognize that the disease, known for years in Nairobi as "dengue," was in reality mild typhus. The credit for this discovery belongs solely to Dr. G. V. Anderson, as I pointed out in a communication to the *Kenya Medical Journal* some years ago. The clinical and laboratory work which established Dr. Anderson's diagnosis was done by members of the Government Medical Service. The results were published by the Director of Medical and Sanitary Services, Dr. Gilks, in his annual report.—I am, etc.,

Belfast, Aug. 20th. P. A. CLEARKIN.

Rectal Prolapse Complicated by Procidentia

SIR,—The divergent views which have been expressed in the correspondence portion of your estimable *Journal* on the treatment of rectal prolapse is further proof that no universally successful operation has yet been evolved for the treatment of this most harassing condition. It seems to me that the ideal operation will only be evolved when our views on the aetiology of rectal prolapse are as well established as those on genital prolapse. The pre-eminent success of the Fothergill operation for the latter condition bears out the truth of my statement.

It is well known that rectal prolapse is common at the extremes of life and rare in adults. Beyond these known facts, the aetiology of rectal prolapse, as it occurs particularly in the adult, seems to be wrapped in mystery. Relaxation of the anal sphincter (and I include the levator ani muscles as part of the sphincter mechanism) may be a factor in the production of rectal prolapse, but, as we shall see, it is not the whole story. Jeannel and Verneul have called attention to the rarity of this condition after traumatism and destruction of the sphincter ani muscles, as, for example, after fistula in ano operations or in perineal lacerations. Stress is laid upon relaxation of the supporting structures of the rectum as an important aetiological factor but what precisely are these structures?

Some years ago I presented to the Obstetrical Section of the Royal Academy of Medicine in Ireland a case of complete prolapse of the rectum, complicated by procidentia. The partial cure obtained by surgical treatment in this case throws a certain amount of light on the aetiology and treatment of rectal prolapse. The patient was a nulliparous woman in the late forties. The first stage of the Fothergill operation for procidentia was carried out in the ordinary way. The second stage, which consists of a colpoperineorrhaphy, was slightly modified. The levator ani muscles, as well as being sutured to each other, were sutured also to the rectum. The external sphincter of the anus was exposed, as in the operation for complete perineal tear, and so plicated as to diminish the size of the anal orifice. The procidentia was permanently cured, and there was no recurrence of the rectal prolapse. A month or so afterwards, however, the patient developed a high rectocele. I had intended to perform a complete obliteration of the pouch of Douglas for the permanent cure of the rectocele, but the patient refused to have the operation. At present the rectocele is fairly well controlled by a ring pessary.

In order to appreciate the inferences which I think logically follow from this case it is necessary to understand the meaning and aetiology of a high rectocele. It is a protrusion of the rectum into the upper portion of the posterior vaginal wall and into the posterior fornix. It is due to the relaxation of the specialized portion of endopelvic fascia which maintains the rectum at its proper level in the pelvis. This consists on either side of a broad vertical band of dense fascia, which contains the middle haemorrhoidal artery, and which extends from the lateral aspect of the rectum to the pelvic wall at the point where the ureter enters the bladder. A high rectocele differs essentially from a low rectocele (the common type), which is a protrusion of the lower portion of the posterior vaginal wall, and which, on account of a mild inflammation of the cellular tissue plain, carries with it a portion of the anterior rectal wall. Should the sphincter ani be relaxed a high rectocele never develops.

In the light of the explanation of the significance of a high rectocele I believe I am entitled to draw the following conclusions from the results of my operation. That, in the adult at any rate, complete rectal prolapse, like a high rectocele, is essentially due to weakness, either congenital or acquired, of the true lateral supports of the rectum, and that weakness of the anal sphincter is a contributory factor. Rectal prolapse in the adult, therefore, is of the nature of sliding hernia. In the female, however, if the sphincteric mechanism of the anus is intact, a high rectocele may develop instead. If the view is accepted that relaxation of the sphincter ani is a contributory factor in the production of rectal prolapse in the adult, then an attempt should be made in the first instance to restore normal sphincteric control. In the female, then, the treatment for complete prolapse of moderate degree is a modified colpoperineorrhaphy. A few years ago a contributor to the *Journal* reported three cases of complete rectal prolapse in the female successfully treated by this method. In the adult a somewhat similar operation may be carried out by making an anterior curved incision in the perineum and continuing the operation by an approach much like that for a perineal prostatectomy. Lockhart-Mummery's operation for a moderate degree of rectal prolapse is successful in a large number of cases. It is a most inelegant operation, however, requiring a considerable amount of post-operative care and confining the patient to bed for weeks. In an *extreme* degree of prolapse, or in the event of a recurrence of the prolapse in the male, or the development of a post-operative high rectocele in the female, then an operation for the complete obliteration of the pouch of Douglas (Moschowitz's operation) should be performed.

As visiting surgeon for many years to a large children's hospital in Dublin, I have had the opportunity of seeing and treating many cases of rectal prolapse in children. Mucosal or partial prolapse is observed particularly in children, and complete rectal prolapse, unlike that in adults, is invariably preceded by mucosal prolapse. When the latter condition persists for some time the anal sphincter becomes stretched and temporarily weakened, and so the partial prolapse becomes complete. The mechanism of production of complete prolapse in children is, then, essentially different from the rarer form which occurs in adults. In children, operation for prolapse is rarely indicated, because healing practically always occurs spontaneously, and the anal sphincter regains its tone when the aetiological factors responsible for mucosal prolapse, such as diarrhoea, hernia, etc., are removed. Occasionally the prolapse persists in spite of appropriate treatment for the removal of the causal factors. It is in such cases, and in the intractable cases of old age, that injection treatment finds its most fruitful application. Personally I have not tried this method of treatment in children.

I have found the simple rectopexy operation, so accurately described by a recent correspondent, almost invariably successful in the treatment of intractable rectal prolapse in children. That the injection of alcohol or any other drug into the perirectal tissue should permanently cure a case of complete prolapse in which the supporting structures of the rectum, as well as the sphincteric mechanism of the anus is permanently damaged, is too much for my credence.

—I am, etc.,

D. J. CANNON, M.B., B.Ch., M.A.O.

Infirmary House, Kildare, Aug. 27th.

Menorrhagia after Splenectomy for Purpura Haemorrhagica

SIR,—Your readers may be unduly influenced by the success attending splenectomy for menorrhagia as recorded by Dr. Stanley Hartfall and Mr. Carlton Oldfield in your issue of July 7th (p. 8), with encouragement in a later issue by Dr. Bernard Myers (August 11th, p. 284). The purpose of this letter is to show the other side of this question.

Splenectomy for purpura haemorrhagica was introduced into this country by Dr. G. A. Sutherland, assisted by the writer, in 1924, with two cases recorded in the *Lancet* in February, 1925. Dr. Parkes Weber was our source of information on the origination of this treatment by Kaznelson of Prague in 1919. The post-operative histories of our original two cases, which were classical examples of the so-called essential thrombocytopenic purpura haemorrhagica, clearly show that splenectomy is certainly not the solution of the problem.

During a post-operative period of ten years one of these patients, a female, has had many serious haemorrhages, and at the onset of her menses five years after splenectomy menorrhagia reduced the numbers of red cells below two millions, and she lay in hospital for many weeks. For a period of eighteen months following the operation all signs of purpura haemorrhagica disappeared. After this they gradually returned, and her constant state now is one of purpura simplex—that is, petechiae and ecchymoses are seldom absent—but, in addition, she has occasional epistaxes. The third patient whose case

was reported in our original article, and who was later subjected to splenectomy, is in the same condition as the case just described: she has skin manifestations of the condition as a constant feature, occasional external haemorrhages, and a definite tendency to menorrhagia.

Splenectomy has established itself beyond doubt as an emergency measure in purpura haemorrhagica. In my experience, apart from such a state of emergency, it has been completely disappointing. Our original cases at the present time can be diagnosed clinically at sight, and the blood state shows a constant thrombocytopenia despite the removal of the spleen. This has been recorded by others. The spleen is only one unit in the reticulo-endothelial system, and if this system is the primary fault the rest of the system appears to be able to ensure the continuance of the disease.

Experience has modified my views during the past ten years. I now look upon purpura haemorrhagica as a manifestation of obscure infection in which the capillaries are especially prone to attack. The platelets disappear from the circulation because these are employed in caulking the damaged vessels. Measures to raise the general standard of health by eradicating sepsis, combating anaemia, and attending to the diet have brought me more permanent results, and I now reserve splenectomy for cases of utmost emergency where haemorrhages endanger life.—I am, etc.,

London, W.1, August 23rd. BRUCE WILLIAMSON.

Treatment of Phlebitis

SIR,—Thrombosis and subsequent phlebitis of the saphenous vein and its tributaries is very common, especially among females, and causes considerable loss of working time. Treatment has always been most disappointing. Some patients, unable to bear the pain, seek their beds, and lie there for months courting pulmonary embolism through clotting of the internal iliac veins; others walk about and appear to do as well as, if not better than, the recumbent cases. The exhibition of massive doses of potassium citrate has been recommended, but it is difficult to understand how this substance taken by mouth can affect a clot, still less have any effect on the inflammation.

Mr. Dickson Wright's treatment of encasing the whole leg from the toes upwards is the only one I have known to be of any avail. I have used it in two cases since reading his article. One had been under treatment for months, the other was a recent one of clotting only; both patients had varicose veins. As a modification I used animal wool over the areas of thrombosis. This wool shows no tendency to mat and is very elastic, for which reasons it is used by chiropodists. The result in both cases was most gratifying.—I am, etc.,

A. P. BERTWISTLE, F.R.C.S.Ed.

London, W.1, Aug. 23rd.

Thrombosis of the Penis

SIR,—I am very glad to see Mr. Clifford Morson's extremely clear explanation of the difference between the terms "priapism" and "pseudo-priapism" (*Journal*, August 25th, p. 371), though it makes the title of a paper which I wrote long ago ("Persistent Priapism from Thrombosis of the Corpora Cavernosa," *Edinburgh Med. Journal*, new series, 1898, iv, p. 267) contain a contradiction in terms. With the progress of knowledge the definition of terms has, I admit, not rarely to be modified or altered, especially for teaching purposes, and Mr. Morson's definition is certainly more intelligible to me than Dr. G. W. Theobald's statement (*Lancet*, 1922, ii, p. 506): "Priapism is not synonymous with 'prolonged erection' or with satyriasis, but is a condition in which the penis is erected without there being any associated sexual excitement."

I must apologize for having at first doubted the advisability or necessity of Mr. Morson's use of the term "pseudo-priapism," but doubt, just as hope, springs eternal in many human breasts, and now I find myself doubting whether Priapus himself—standing day and night through all kinds of weather in the fields and groves of the ancient classical world, always exhibiting his enormous and erect phallus—may not have been, after all, a sufferer from some kind of vascular *pseudo*-priapism.

I am sorry that I have no information to give Mr. Morson as to subsequent history of impotence, etc., in the few leukaemic and non-leukaemic cases of penile thrombosis which I have seen.—I am, etc.,

London, W., Aug. 25th. F. PARKES WEBER.

"Closed" Anaesthesia

SIR,—I am struck by the following passage in your leading article on the above subject (August 25th, p. 360):

"The author notes that 'relative overdosage'—a phenomenon long familiar to anaesthetists—which means, in a sentence, that a given saturation of the blood by anaesthetic agent produces a deeper level of anaesthesia in the later than in the earlier stages of an administration, occurs much more noticeably in nervous than in stolid patients . . . that in the latter type a larger proportion of the drug used is absorbed into the blood."

It is then suggested that this is due to some physical difference in the blood of these different types of patients. This appears to conflict so much with clinical experience and with the theoretical evidence of such men as Crile and Henderson that I venture to disagree with this last statement, and for the following reasons.

In a closed system of anaesthesia once the level of anaesthesia has been reached which is desired clinically the supply of anaesthetic agents is stopped, and with an airtight system the anaesthetic content is from this time on a constant fixed amount. The contents of the system are in gaseous equilibrium with that of alveolar air, which is in turn an accurate measure of the gas pressure to which blood leaving the lungs is saturated. Thus, for this level of anaesthesia the anaesthetic content of the blood will be in equilibrium with the contents of the closed system, which is a constant fixed amount. In these circumstances it follows that when this relative tolerance does appear it cannot be due to an increase in the anaesthetic content of the blood, for until more anaesthetic agent is added to the system the anaesthetic content of the blood cannot rise, as it is in gaseous equilibrium with the contents of the system. Since in closed anaesthesia the control which one has over the anaesthetic agents used is absolute, one can vouch for the degree of blood saturation and its maintenance once the level of anaesthesia desired clinically has been attained.

If alterations occur in the patient's clinical condition these alterations must therefore be due to an altered reaction on his part—an increased susceptibility to that quantity of anaesthetic agent already present. In the nervous or the toxic patient this relative tolerance occurs earlier and more readily, and one must take it that his psychic or toxic state predisposes to the earlier onset of this phenomenon. Clinically one has come to look upon this phenomenon as a sign of incipient surgical shock. Crile's definition of shock is "a state of exhaustion which has been rapidly developed by psychic, traumatic, toxic, or thermal stimuli." His researches denoted that the psychic factor incident to major operations was exceedingly important: it was sufficiently powerful to overwhelm the patient, so that in some cases death was due to the emotional factor alone. I have seen just such a case.

If a basal anaesthetic is employed the nervous patient comes to the theatre freed from the influences of the higher cerebral centres. He is in effect a standard physiological preparation, in much the same manner as a decerebrate animal, and will consequently react in a standard physiological manner to a given set of conditions brought about by the anaesthetist. Patients so prepared do not so readily show signs of relative tolerance, but react after the manner of the stolid type. In closed anaesthesia a relative tolerance can develop apart from this toxic or nervous type. I believe this to be due to a too complete absorption of carbon dioxide by the soda lime, which lowers the carbon dioxide tension of the blood. This depresses the respiratory centre and reduces the amplitude of respiratory movement which, by preventing the relaxation of the heart in diastole, hinders the venous return and makes a circulatory failure possible as a result of the diminished cardiac output. Of equal importance is the production of an anoxaemia of the anoxic type. In spite of the fact that the oxygen tension in the blood is adequate, oxygen is not readily available owing to the low carbon dioxide tension hampering the dissociation of oxyhaemoglobin. By increasing the carbon dioxide contents of the system this clinical condition is rapidly rectified. If these causes have been allowed to act for too great a length of time the oxygen supply must also be increased. In event of an increase of carbon dioxide and oxygen failing to rectify the clinical condition of relative tolerance, the inference is that the causes have been acting for too great a length of time, and consequently the damage has been done and surgical shock is actively present. In this state the condition of relative tolerance or susceptibility—I would prefer to call it shock—has been established, and a reduction of the pressure of the anaesthetic agent in the system is necessary to reduce the tension of anaesthetic in the blood. At the same time the routine treatment of shock is instituted.

In a closed method of anaesthesia one can recognize clinically a " pre-relative tolerance " stage, a relative tolerance stage, and, finally, the stage of established surgical shock. The pre-relative tolerance stage is manifested by irregularities in, or shallowness of, the amplitude of respiratory excursions as shown on the manometer. The use of the carbon dioxide by-pass valve will rapidly rectify matters. In the relative tolerance stage, again, there are irregularities of respiratory movement, depressed breathing, and inspiratory tugging. The blood pressure falls, the pulse becomes full and soft, and may become rapid. These two stages are " pre-shock " stages, and are relieved by the exhibition of carbon dioxide, or carbon dioxide and oxygen. Shock is not established, and consequently, if those forces acting to produce it are relieved, its advance is arrested. This becomes a therapeutic test, for if the condition is not arrested then one can be perfectly sure the patient has reached the third stage—the state of surgical shock.

These facts lead one to consider that relative tolerance or overdosage is not due to any physical peculiarities of the blood *per se*, but rather to an increased tolerance—in effect, the early onset of shock. Its incidence can be reduced by the use of basal anaesthetics. In a closed system of anaesthesia it offers a reliable clinical index of approaching surgical shock. The physiological regulation of that hormone of the respiratory system, carbon dioxide, which in a closed system can be accurately controlled, will reduce the incidence of surgical shock, delay its onset, and provide a reliable guide as to whether it is actually established. A survey of surgical shock in anaesthesia and the relative value of different agents and methods is being investigated at present, and will be the subject of a future communication.—I am, etc.,

London, W.6., Aug. 29th. T. A. B. HARRIS.

Treatment of Lupus Vulgaris

SIR,—Dr. Burnell-Jones is evidently of opinion that, however extensive the trials of tuberculin in lupus may have been in the past, they have not been adequate, and that the clinical work now in progress in London and elsewhere is likely to remedy the defect. I agree entirely with him on both points.

The London work to which he refers is described in a paper by Dr. H. Semon and himself entitled " Tuberculin in the Treatment of Cutaneous Tuberculosis," and published in the *Proceedings of the Royal Society of Medicine* (January, 1934). In this the authors describe cases of lupus showing definite improvement under progressively increasing doses of tuberculin B.E., rising to large quantities. If this work, on visible cases where we can see what is happening, is steadily continued for a sufficient length of time, we shall at last obtain material from which to learn the truth about the value of tuberculin, not only in lupus, but eventually in other forms of tuberculosis as well. Lack of the Hunterian method, carried out with intimate knowledge of Koch's work, has been to a large extent responsible for the inadequacy of the investigations into this subject in the past.

An article by Sir Malcolm Morris and Dr. Arthur Whitfield, entitled " Six Cases of Lupus Vulgaris Treated by Koch's New Tuberculin " (*British Medical Journal*, 1897, ii, 207), is almost the only serious attempt reported in this country to confirm in lupus Koch's completed work on tuberculin. This article still merits close attention, but the work was too soon abandoned, owing apparently to the introduction of Finsen light treatment, or to being diverted by the opsonic index and fear of dangerous consequences—strangely enough after the authors had reported " full confirmation of the good effects referred to by Koch " and remarkable improvement in the cases treated.

It is greatly to be hoped that the work now in progress in London will not be hampered by want of support. Those who have worked at this problem know how heavy are the demands it makes on time, energy, and staying power. There are sufficient funds in the hands of the Medical Research Council and other bodies entrusted with the patronage of medical research to subsidize work of such potential practical value. I have no hesitation in calling upon all who are in sympathy with these views to unite in creating the demand for support of every description for one of the most promising, long overdue medical researches of our time.—I am, etc.,

London, S.W., Aug. 26th. ROBERT CARSWELL.

SIR,—In a letter from Dr. H. S. Burnell-Jones, published in the *Journal* of August 25th (p. 375), he declares that " it is wrong and unscientific to condemn tuberculin without an adequate trial. The endeavour should be made to learn how to use it."

It is pertinent to inquire on what grounds Dr. Burnell-Jones charges the medical profession with not having given tuberculin an adequate trial. Tuberculin has now been before the profession for some forty years. Having been widely given up after its first rather disastrous start, it was re-boomed about 1911. For some years it was tried on a most extensive scale, so much so that letters appeared in the *Journal* expressing a fear of tuberculosis dispensaries becoming " tuberculin dispensaries." Possibly these events do not fall within the memory of Dr. Burnell-Jones.

Further, he quotes Dr. Lomholt as saying—with regard to the use of tuberculin in lupus vulgaris—that it " had been tried extensively at the Finsen Institute," so we are left to infer that he does not consider this extensive trial at the Finsen Institute to have been an " adequate

trial," because the result was that tuberculin had been abandoned. Dr. Burnell-Jones thinks that we never learnt how to use it. Perhaps he will be kind enough to explain how our methods were all wrong, and what is the proper method as known to him.

We agree that " it is wrong and unscientific to condemn tuberculin without an adequate trial," but we deny the impeachment (which is surely just a little presumptuous on the part of Dr. Burnell-Jones), and we would point out that it is equally wrong and unscientific to credit tuberculin with the cure of tuberculosis on the strength of occasional good results in a disease which, as common experience shows, provides many instances of improvement or arrest of disease by the *vis medicatrix naturae* alone. He must produce satisfying evidence, supported by proper controls. Also, to talk of " widely different actions [of tuberculin] in different individuals " is simply to hedge. Not so do we speak of those specific remedies which have proved to be trustworthy in other diseases.—I am, etc.,

E. WEATHERHEAD.

Southborough, Tunbridge Wells, Aug. 26th.

Haemorrhage from Peritonsillar Abscess

SIR,—Both Professor J. B. Dawson (August 11th, p. 284) and Mr. Charles MacAuley (August 25th, p. 371) consider it wiser to tie the external, rather than the common, carotid in cases of haemorrhage from a peritonsillar abscess. I would remind them, however, that the tonsil is partly supplied by the descending palatine branch of the *internal* carotid (Cunningham). Should the bleeding originate from this source, ligature of the external carotid alone would certainly not " meet the case." Ligature of the external carotid will undoubtedly stop the majority of haemorrhages from the peritonsillar region, but the exceptions will most likely prove fatal. Any considerable further haemorrhage would certainly have killed my patient, and this fact was kept in mind when deciding which artery should be tied. Perhaps the best procedure would be to ligature the external carotid, and at the same time to leave a stout catgut ligature loosely around the internal carotid, ready to be tied at a moment's notice. Alternatively one could dissect out the tonsil and look for the bleeding vessel in its bed, as has been already suggested.

Both Professor Dawson and Mr. MacAuley comment upon the operative difficulty caused by swollen lymph glands. This was not present in my case, presumably because of the long interval which had elapsed between the bursting of the quinsy and the ligature of the artery.—I am, etc.,

Dublin, Aug. 27th. T. G. WILSON.

Use of "Oil" Vaccine in Rheumatism

SIR,—In the *Journal* of August 25th Drs. Walsh and Frazer (p. 374) ask the size of the globules in the dispersed phase of the " oil " vaccine described in my letter (*Journal*, August 4th), stating that in their experience globules of a size of 2 to 2½ μ are too large to be of any value (2 to 2½ mμ, as their letter states, is no doubt a misprint—2 $\mu\mu$ would, of course, be much too small to measure).

In our oil the average size of the particles is 1 μ, gum acacia is used for protection, and the emulsion is rendered isotonic with mannite. The oil is sterilized by heat and preserved by 0.3 per cent. tricresol ; 1 c.cm. of vaccine in carbol saline is then added to 9 c.cm. oil emulsion at 37° C. After an hour or two it is allowed to cool. We have found that the addition of the protective to the emulsion prior to the adsorption of vaccine is in no way detrimental, and the isotonicity obviates any local reaction at the site of injection. This, then, is the general " oil " vaccine which the staff of the Charterhouse Rheumatism Clinic has now used in a considerable number of cases.

Experimental work is proceeding under Dr. Harry Coke's direction in order to determine: (1) a clinical elution isotherm in relation to the size of the particles and the relative surface available (at the other end of the scale we are therefore using a 50 per cent. protected isotonic emulsion of olive oil in which the average size of the particles is the same and the available surface very large) ; and (2) the effect of the chemical constitution of the dispersed phase. Here an attempt is being made to determine the relative value of other colloids in producing specific immunity and desensitization phenomena. We are trying colloidal cholesterol, calcium, and magnesium oleate (with an average size 0.1 μ), calcium and magnesium phosphates and hydroxides, and, perhaps most important of all, the selective adsorption of calcium or magnesium salts with vaccine on a neutral colloid, such as silica. The preparations, as before, are by British Colloids, Ltd.

I should add that no means are taken for solution of the bacterial content of the vaccines. Partial autolysis is always to be found in vaccines prepared from broth cultures and put up in carbolized saline.—I am, etc.,

London, W.1, Aug. 30th. H. WARREN CROWE.

"Port Sanitation and Common Sense"

SIR,—The article, so ably written by " A Ship Surgeon," in the *Journal* of August 25th raises many points of interest and calls for some comment.

His remarks anent " bills of health " are sound and true, but it is worth emphasizing that the reason for their loss of value is due to two things. First, news nowadays travels faster than the ship, hence the bill of health is out of date and valueless by the time a vessel reaches any port a reasonable distance from the port of origin. Secondly, thanks to the work of the International Bureau of Hygiene at Geneva, a weekly confidential list of all ports where infection exists, together with facts and figures, is circulated to all port medical officers, who are thus kept strictly up to date in information. With regard to British bills of health they are at least issued free, and not like some foreign ones where fabulous sums have to be paid for a piece of paper the philatelic interest of which far exceeds any potential or actual value. In the second part of your correspondent's paper, under the heading " Ship Hygiene," I think his outlook and picture are drawn from the interior of a first-class liner. Has he inspected many cargo vessels and smaller fry of the " tramp " class?

It is in the last part of his article, in which he criticizes port authorities, that I would cross swords with " Ship Surgeon." Abroad things may be out of date—in many cases I know they are. In Great Britain the port authorities have a very definite reason for every measure they take, and I cannot recall, or think off-hand of, a single matter which could be reasonably cavilled at. I agree that the status of the ship surgeon has improved, and in the larger companies, where something approaching a permanent career is offered, the best type of doctor is obtained. Port authorities have to consider *all* types, however, both British and foreign, and one cannot make one routine for the one and a different routine for the other.

The question, " Have you had any illness on board, whether of an infectious nature or not?" is most important, as " Ship Surgeon " promptly proceeds to substantiate in his succeeding remarks. Port medical officers *have* both the time and the patience to listen to a recital of the bo'sun's lumbago, the carpenter's rheumatism, and the steward's diarrhoea ; for there at once lie the potential

and perhaps ambulatory cases of small-pox, gonorrhoeal sequelae, and typhoid fever, to name a few. The mere mention of the diagnoses "Ship Surgeon" gave would at once excite in the mind of a port medical officer such possibilities, and *quite possibly* would *not* have aroused suspicion in the mind of the ship's surgeon. Having been "let down" by each of these three types of case, I can speak with feeling on that point. I feel that I should personally treat "Ship Surgeon" with some suspicion if he declined to answer that question properly.

Surely he has taken the parochial outlook rather than the broad view with regard to port authorities. Does he not realize that they are out to help and not to hinder? The port medical officer, even abroad as well as at home, has special qualifications for knowing the major infectious diseases when he sees them, and in most instances meets them so frequently that he has the practice as well as the knowledge. Let the ship's surgeon therefore avail himself of a second and expert opinion whenever he can, lest one day he trip up over the differential diagnosis between his pimples and his small-pox. The port medical officer knows the local facilities for dealing with "the commander's indigestion" and "the stewardess's debility," not to mention "the fireman's whitlow," etc., and if assistance in landing and catering for these cases is required the port authority will help in the matter.

In short, the port authority does its best to take all the responsibility possible off the hands of the ship's surgeon, and it is up to him "to deliver the goods." In conclusion, let "Ship Surgeon" remember that most port medical officers know his difficulties, and most of them have been through them in the past; but whereas his charge is the relatively small "parish" of the ship the port medical officer's "parish" is the entire population of the country whom it is his duty to protect from imported disease.—I am, etc.,

August 26th. "A PORT MEDICAL OFFICER."

Pineapple Juice in Oedema

SIR,—I should like to add another old-fashioned remedy to Dr. F. C. Bottomley's list for the treatment of oedema (as reported in the proceedings of the Section of Medicine, *Journal*, August 18th, p. 315). At Broken Hill (Australia) in 1929 I saw a case of cardiac oedema in a woman of 30 with a patent ductus arteriosus completely relieved in three weeks by the daily administration of pineapple juice. When the treatment was started the patient was oedematous to the waist, and there was fluid in both pleural cavities. Digitalis, mercurial compounds, and so on had been tried without success, and the pleural sacs had been drained and were filling up again rapidly. She was given the juice from a tin of pineapple daily, and in a fortnight her urinary output had risen from 18–20 oz. to 60–100 oz. in twenty-four hours. The oedema of her back and legs completely subsided and the fluid disappeared from the pleural cavities in about three weeks. The patient left the hospital, reporting some months later still apparently free from oedema: she was then consuming one tin of pineapple per week. The pineapple juice was administered in the first place because I was told that it was a good old-fashioned remedy for reducing the swelling of sore throats and quinsies, and nothing seemed to be doing the patient any good. The action of the juice may have been due to some essential constituent of the pineapple or to its sugar content, but this point has not been investigated. The case was fully reported in the *Medical Journal of Australia* in 1930.—I am, etc.,

BRIAN MAEGRAITH.

Sir William Dunn School of Pathology,
University of Oxford, Aug. 21st.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

During the months of June and July the title of the degree of B.Chir. was conferred by diploma upon C. M. Cavell and D. J. Thompson (Newnham College), and R. A. Kellgren (Girton College).

Charles Montague Fletcher, B.A. (Trinity College), has been elected to the Michael Foster Research Studentship.

The General Board gives notice that the composition fee for all medical students and for other students reading for the Natural Sciences Tripos, Part I or Part II, or for the Preliminary Examination in Natural Science, will be as follows: For undergraduates in their first, second, or third year an annual composition fee of £45, payable in three equal terminal instalments of £15; for students in their fourth year a terminal fee of £8.

The *Cambridge University Reporter* of August 14th included a list of lectures and courses of practical instruction in medicine, surgery, pharmacology, therapeutics, and pathology, and for the Diploma in Medical Radiology and Electrology, approved by the Board of the Faculty of Medicine for the academic year 1934–5.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—F. A. Frank, F. M. Kerry, J. T. Moohalaparackel.

MEDICINE.—S. Adams, T. D. R. Aubrey, M. T. Curran, A. H. El. S. El Mahallawy, R. C. H. Ensor, F. A. Frank, W. H. Jervis, C. W. O'Donoghue, J. F. Owen, H. Paroulakis, D. Walton.

FORENSIC MEDICINE.—F. G. S. Alderson, F. A. Frank, W. H. Jervis.

MIDWIFERY.—J. A. Amor, N. A. Bicchieri, D. P. Hickey, F. M. Kerry, K. P. Pauli.

The diploma of the Society has been granted to F. G. S. Alderson, M. T. Curran, J. T. Moohalaparackel, C. W. O'Donoghue, J. F. Owen, and H. Paroulakis.

The Services

AWARDS

The Gilbert Blane gold medal for this year has been awarded to Surgeon Lieutenant-Commander T. C. H. Neil, M.B., Ch.B., who obtained the highest aggregate marks at the examination for the rank of Surgeon Commander.

The King has conferred the Efficiency Decoration of the Territorial Army upon Lieut.-Colonel C. H. Budd, M.C., and Major V. H. Wardle, M.C., R.A.M.C.(T.A.).

DEATHS IN THE SERVICES

Lieutenant-Colonel Edmund Hasell Wright, Madras Medical Service (ret.), died at Woking on August 13th, aged 65. He was born at Masuri on September 16th, 1863, the son of George Augustus Wright, indigo planter, and was educated at St. Thomas's, taking the M.R.C.S., L.R.C.P. in 1887. Entering the I.M.S. as surgeon on March 31st, 1890, he became lieutenant-colonel after twenty years' service, and retired on November 8th, 1921. After fifteen years' military duty he was appointed civil surgeon and superintendent of the medical school at Tanjore in 1906, and civil surgeon of Merkara, Coorg, in 1916.

Major James Lafayette Lauder, D.S.O., M.C., R.A.M.C. (ret.), died on July 18th, aged 45. He was born on June 18th, 1889, the son of J. S. Lauder, Esq., and was educated at Dulwich and at Guy's, and took the M.R.C.S., L.R.C.P.Lond. in 1913, and the M.R.C.P.Ed. in 1916. He took a temporary commission in the R.A.M.C. on August 8th, 1914, was confirmed as lieutenant and temporary captain on January 1st, 1917, became captain on February 8th, 1918, and major on August 8th, 1926. He went on temporary half-pay on account of ill-health on August 17th, 1932, and retired two weeks later, on August 31st, 1932. He served throughout the war of 1914–18, was mentioned in dispatches in the *London Gazette* of December 11th, 1916, and December 24th, 1917, and received the D.S.O. and the Military Cross, the former for his services during the typhus epidemic of 1916 in the Wittenberg prisoners' camp.

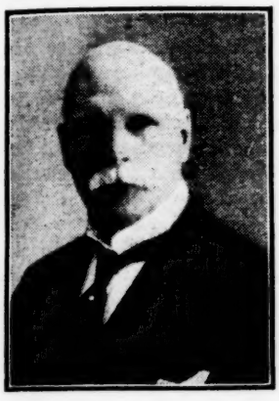
Obituary

ROBERT ALEXANDER GIBBONS, M.D.,

F.R.C.P.Lond., F.R.C.S.Ed.

Consulting Gynaecologist to the Grosvenor Hospital for Women

We regret to record the death in London, on August 23rd, of Dr. R. A. Gibbons, the well-known gynaecologist. Born in Canada, he studied medicine at Edinburgh, graduating M.B., C.M. in 1874, and M.D. in 1877. Five years later he took the F.R.C.S.Ed. and the M.R.C.P.Lond. ; he was elected F.R.C.P. in 1932. Dr. Gibbons held resident appointments at the Royal Infirmary, Edinburgh, and was for two years R.M.O. at the East Suffolk and Ipswich Hospital. He later obtained the post of resident medical officer to the Great Ormond Street Hospital for Children. Settling in a house in Cadogan Place in the 'nineties, he soon built up a large and fashionable practice, and it was not long before he became known to a wide and important circle in London. He held the appointments of obstetric physician to the St. George's and St. James's Dispensary and the Royal Pimlico Dispensary, but it is in connexion with the Grosvenor Hospital for Women, Vincent Square, that Dr. Gibbons is best known. He was the founder of this hospital, which began in a very small way in two houses in the Square, and it was owing largely to his energy and enthusiasm that the present well-equipped hospital was built. He collected considerable donations for it from his rich and grateful patients, and the hospital is, in truth, his child. He spent a large portion of his life doing excellent work there, and at his death was the senior consulting gynaecologist. Dr. Gibbons contributed a number of papers to medical journals and also the articles on dysmenorrhoea, sterility, and dyspareunia in Latham and English's *System of Treatment*. He also wrote two brochures on sterility in women and another on the causation of labour, a subject in which he was greatly interested and to which he devoted much thought, industry, research, and experiment. He had been a member of the British Medical Association for nearly sixty years, and was vice-president of the Section of Obstetrics and Gynaecology at the Belfast meeting in 1909.



Sir JAMES DUNDAS-GRANT writes:

The death of Dr. R. A. Gibbons will be a blow to a large circle of patients, friends, and fellow practitioners. For his patients it will be difficult to find an adviser who, in addition to having good judgement and skill, possesses in so high a degree his qualities of tact, delicacy, and sympathy, which are particularly indispensable in one who devotes himself to the obstetrical and gynaecological department of medicine. His personality, brightness, and loyalty endeared him to many friends, lay and professional. One who was a few years his junior when he was house-surgeon and house-physician at Edinburgh well remembers the example he set of business-like intensity in his devotion to work, and the consistent maintenance of the dignity of his calling in his conduct and bearing, even down to his preciseness in dress. The demand in London for his services as an obstetrician was so great that he decided not to accept the post of obstetric physician to a teaching hospital, as he felt unable to devote to it the amount of time that would have been required for the conscientious performance of the duties as he conceived them. Among those who will deplore his loss will be the members of the Order of St. John of Jerusalem, in which he held the position of Knight of Grace, and many freemasons of all ranks. Up to the last he enjoyed his round of golf and maintained his appearance of youthful freshness, to which moderation in diet and regimen no doubt contributed. He took the serious things of life with seriousness, the lighter ones with good humour, and in more ways than one he was an ornament to his profession.

Sir GOULD MAY writes:

From the very beginning Gibbons's success in practice was phenomenal. Having studied under Lister in Edinburgh, he fully realized the importance of antiseptics, and he may be said to have been one of the pioneers of aseptic midwifery in London. A man of fine presence, courteous manners, and most generous instincts, he was always anxious and willing to help the younger man, while he was never puffed up by his wonderful success. Few doctors have been more beloved by their patients, and he will have the only monument worth having—a safe place in the hearts of all those who knew and loved him.

CECIL W. HUTT, M.D., M.R.C.P., D.P.H.

Medical Officer of Health for Holborn

The sudden death of Dr. Cecil W. Hutt, medical officer of health for the Borough of Holborn, at the comparatively early age of 54, removes a public official of undoubted distinction.

He was a Londoner by birth, and while at St. Paul's School he showed those gifts of scholarship which remained with him throughout his life. In 1898 he gained an exhibition to Trinity College, Cambridge, taking his B.A. in 1902 with a first class in the Natural Sciences Tripos, Part II. Then followed his medical training at St. Bartholomew's Hospital, where he was awarded the Matthews Duncan Prize and Brackenbury medical scholarship, qualifying in 1905.

After holding several clinical appointments he took the Oxford D.P.H., entering on his public career as assistant M.O.H. in Warrington, and later as deputy to Dr. Duncan Forbes, medical officer of health for Brighton, with whom he remained on the most intimate terms of affectionate friendship. He always looked back on the years at Brighton as the time of happy apprenticeship, and remembered with gratitude the valuable and varied experience he acquired there. There was much to do in Brighton during the war, for in that city was established the chief hospital organization for the Indian contingents, and the incidence among them of infectious disease, such as cerebro-spinal fever, gave much anxiety to civilian health officers there as elsewhere. As soon as he could be released Hutt joined the Army, and after a period of service in home commands was drafted to Egypt, where he had the misfortune to contract dysentery in a severe form. There is little doubt that the after-effects of this infection remained, and played a part later in undermining a constitution normally robust.

Soon after the war he was appointed medical officer of health for Dudley, and later for Richmond, Surrey, but it was not until 1921 that he succeeded the late Dr. Bond as medical officer of health for Holborn. A metropolitan borough does not offer so wide a field for an official of imagination and initiative as an area of comparable size in the provinces, but Dr. Hutt soon set the seal of energy and progress on the health services of the borough.

He found most scope in the newly developing maternity and child welfare movement, and to-day it would be difficult to find anywhere a more complete or better-organized service. He was the first medical officer of health in London to grasp the value of protective immunization against diphtheria, and his scheme for the general population was probably the first in operation in England. He was a Fellow and member of the Council of the Royal Institute of Public Health, Fellow of the Society of Medical Officers of Health, one of the founders of the School Medical Service Group, and took a prominent and executive part in the activities of the National Baby Week Council and the National League of Health Maternity and Child Welfare. Further, he occupied a position of considerable responsibility as the medical member among the advisory experts attached to the special subcommittee of the Metropolitan Standing Joint Committee which is dealing with the urgently important question of refuse disposal in London.

Hutt was a lucid and facile writer, and throughout his public career contributed very frequently to the medical and health journals on a variety of subjects dealing with public health. Among these may be mentioned "The Urgent Need of Reform of the Sale of Food and Drugs Act Administration (Public Health)" and "Diphtheria Immunization in a Metropolitan Borough (*Lancet*, 1925). School hygiene was the subject of his special interest, and he wrote a number of articles embodying much original thought both in French and in English journals. He was the author and part author of a number of text-books, perhaps the earliest and best known being his *Hygiene for Health Visitors, School Nurses, and Social Workers*—one of the best books of its kind ever published. He collaborated with several others in bringing out a later edition of that excellent textbook, Sir William Hamer's *Manual of Hygiene*, and at the time of his death had almost ready for publication a more ambitious work on preventive medicine under the co-editorship of Dr. Hyslop Thomson. Travel abroad was one of the joys of Hutt's existence. Difficulties or discomforts in the means of travel never dismayed him, and he would be happy even to tramp rather than miss an interesting place or people. He had an intimate knowledge of many parts of the Continent, and often while on holiday made a point of studying health administration and institutions in different lands. These visits were afterwards recorded in such journals as *Health*, *National Health*, etc. Possessed of a wide and detailed knowledge of the whole subject of public health, he was able, as a lecturer to the D.P.H. students of the Royal Institute of Public Health and to the undergraduates at Charing Cross Hospital, to present the subject in an illuminating and impressive manner.

He was a man of the most kindly and generous disposition, always willing and helpful if approached, but extremely modest and most unwilling to thrust himself forward. As an old friend once wrote of him: "An unassuming worker whose quiet endeavours to gather knowledge and to aid others inspire his colleagues with a sense of fellowship and partnership in the common work." He retained his youthful appearance, and sometimes associated with it a delightfully boyish shyness. Rarely did he speak harshly of anyone, and even for those who might occasionally merit a bitter word he almost apologized with a deprecating smile. He applied to the problems of public health a finely imaginative and constructive mind; his outlook on the issues which emerge in the unfolding of this scroll of knowledge was philosophic. Hutt looked across and beyond the questions of the hour to the horizon of the future, and the ideas he expressed were the products of a highly cultivated intellect. But he likewise possessed the ability to put those ideas into practical form, and many a scheme which he has brought into execution serves, and has served, as a useful pattern to others. He was whole-heartedly devoted to his profession, and there is little doubt that he sacrificed his life to a passion for work. His health had broken down earlier in the year, and he returned after a period of rest and change, but far from fully recovered. The demands of his official work and those entailed by the completion of his latest textbook were more than an already overtaxed constitution could bear. So he has passed on in middle life while intellectually at the height of his powers, leaving behind him the sincere regrets of many friends and colleagues.

E. D. MACNAMARA, M.D., F.R.C.P.

Consulting Physician for Psychological Medicine, Charing Cross Hospital

We regret to record the death, on August 24th, at the age of 64, of Dr. Eric Danvers Macnamara, the well-known psychiatrist. He had had a busy life. After taking the ordinary qualification of the English Royal Colleges in 1897, he became a surgeon in the Royal Navy for five years or more. During his term of service he was almost exclusively attached to the China Squadron, and served in the Pekin relief force, for which he obtained a medal and clasp. But surgical life in the Navy was so distasteful to him that he resigned rather than remain another couple of years to qualify for a pension. He then graduated at Cambridge, taking the M.B., B.Ch. in 1903 and the doctorate in 1908. It was then that he switched over to medicine, and became particularly interested in mental diseases, the clinical aspects of which he first studied as house-physician to Bethlem Royal Hospital. With the same object in view he became house-physician to the National Hospital in Queen Square, neurology and psychiatry being supposed, in those days, to be more intimately related than they are to-day. He was appointed assistant physician to Westminster Hospital, his Alma Mater, where he subsequently became dean of the medical school, and he had many other appointments to keep him busy. He was on the staff of the West End Hospital for Nervous Diseases and the Paddington Green Hospital for Sick Children. He was lecturer on mental diseases to Charing Cross Hospital, and gave post-graduate lectures regularly at Bethlem Royal Hospital. At one time he was examiner in psychology to the Conjoint Board of the Royal Colleges of Physicians and Surgeons. During the war he served in the R.A.M.C. and also in the Medical Department of the Admiralty. His contributions to medical literature appear to have been almost limited to articles in various encyclopaedias of medicine: Latham and English's *System of Treatment*, *The Practitioner's Encyclopaedia*, the *Dictionary of Practical Medicine*, and Price's *Textbook of Medicine*.

Macnamara was a cheery companion, but had a very retiring nature. He devoted his life to mental disease, and was unusually devoid of such hobbies as would have brought him into more intimate contact with his fellows. Even his domestic life had many associations with his special study. He married Frances Mary, daughter of Dr. W. Simpson Craig, who was proprietor and superintendent of Bishopstone House, a successful private mental home in Bedford, and sister of Sir Maurice Craig, with whom Macnamara collaborated in several of the above-mentioned articles. He leaves two sons.

Surgeon Commander G. ERNEST MACLEOD, R.N. (ret.), writes: The medical profession has sustained a great loss by the recent untimely death, after a short illness, of Eric Danvers Macnamara. A man of attractive presence and exceptionally charming personality, his quiet, unassuming manner concealed the outstanding ability and wide

sympathies which he possessed and devoted in such full measure to that department of medicine which he had made his own. To an extensive knowledge of men and matters he added a keen sense of humour, an enjoyment of life, and an optimistic outlook on affairs generally, which made him a most delightful companion. On his academic and professional attainments it would be superfluous to dwell, but I think it is no exaggeration to say that his name and work will long be remembered with affection and gratitude by patients, students, and colleagues alike. My friendship with him began many years ago, when we entered the medical department of the Navy together, and has continued ever since, and it is less than three weeks since I last had one of his usual cheery letters, in reply to one of mine, in which he asked me to hurry up and come to town again soon for one of our periodical dinner-and-theatre meetings which were always such a great pleasure, and to which I was looking forward. It is painfully sad to think that we shall not meet again.

C. C. ELLIOTT, M.D.ONT., F.R.C.S.ED.

Dr. Charles Coyne Elliott, who died on August 10th, had had a varied and interesting career before settling in general practice in Leicester. Born and educated in London, Ontario, his intellectual gifts manifested themselves very early. In fact, his contemporaries in the Medical School remember him as "the man who made one mistake," for he was said to have only once answered a question incorrectly. He took his M.D. degree in 1900, at the same time winning a gold medal, which had not been awarded for so many years that the possibility of securing it had almost been forgotten. After a few years' practice in Canada, Elliott went to China as a medical missionary, and found great scope for his scientific attainments in the treatment of patients in the extreme Western Province of Szechuan. Before his day it had not been recognized that the many severe cases of anaemia were due to ankylostomiasis, and he was the first to understand that the terrible abdominal pain "which ceases at cock-crow" was due to duodenal ulcer. He contributed to the *China Medical Journal*, September, 1918, a study of forty cases of duodenal and gastric ulcer submitted to operation. Dr. Elliott was very successful in training male medical students and nurses, and the hospital which he built was a model of economy, efficiency, and thoroughly scientific method. As time went on it became clear to him that medical students needed more than the spare time of a busy doctor, and he decided to throw in his lot with the medical school in Chengtu, where he taught clinical surgery. He was very successful in gaining the respect and affection of the Chinese medical students (not, at that time, a very amenable class of men), and many of those whom he taught are now doing most excellent work.

He used some of his time on furlough to obtain the F.R.C.S. at Edinburgh (1913), and on his last return from China spent time in study at University College Hospital and in Paris with a view to maintaining the high standard of the West China Union University in Chengtu. It was only the pressure of domestic affairs which forced him to abandon his intention of returning to China.

Dr. JOHN TERTIUS CLARKE died at his home in Harrow on August 31st at the age of 69. Born at Hinckley, Leicestershire, in 1865, Clarke was educated at Dulwich College and St. Thomas's Hospital, and qualified M.R.C.S., L.R.C.P. in 1889. In 1891 he became house-surgeon to the Royal Hants County Hospital, Winchester, where he met his future wife, Miss Mary F. Cosgrove. He served as ship surgeon for two years, and in 1896 he joined the Perak Medical Service. In 1906 he took the D.P.H. Cantab. and became medical officer in the public health department, Federated Malay States, in 1911. In 1920 he retired from the service, but remained in Malaya till 1926, carrying on an extensive practice on various rubber estates, the work consisting chiefly of the prevention of malaria and ankylostomiasis. In 1926 his heart began to trouble him seriously, and he came home to England via Canada. On his way home he was taken very seriously ill in British Columbia, but recovered, and through his indomitable pluck was able to lead a life of useful though restricted activity for another eight years. Clarke was impressed by the rarity of rheumatic fever in the Tropics, and during his eight years at Harrow he worked at the Ross Institute at Putney, carrying out researches into the causes of rheumatic fever. He wrote several articles in the *British Medical Journal* in support of his theory that rheumatic fever is transmitted by sewer rats. He was also much interested in the research work on cancer of the late Dr. Shaw Mackenzie, and gave him great help and encouragement in his labours. Tertius Clarke was keen on the work of the British Medical Association, and was a constant attendant at meetings of the Harrow Division while his health permitted; he served as honorary secretary in 1929–30. The Malaya Branch elected him a complimentary member. He broke his thigh at the age of 15 and could never afterwards move quickly enough to excel at active games, but he was a keen golfer and no mean performer. His courage and keen sense of humour in the face of grave physical disability endeared him to all who met him, and their sympathy will go out in abundant measure to his widow and two sons.

The death took place suddenly at Buxton, on August 30th, of Dr. DAVID DUNCAN MAIN, who for many years was one of the best-known missionaries in China. Dr. Main was born at Kirkmichael in 1856, and after studying medicine in Glasgow and Edinburgh took the triple qualification of the Scottish Corporations in 1881. He immediately began work as a medical missionary in China, and from 1881 to 1927 was superintendent of the Church Missionary Society Medical Mission at Hangchow, and principal of the Hangchow Medical Training College. Here he was in charge of a large hospital, and was the head of a native medical school where many hundred Chinese men and women were trained for medical work. He organized a centre for training in industrial work, at which the mission provided practical instruction for masons, carpenters, tinsmiths, painters, etc., and inaugurated sanatoria for convalescents and tuberculous patients, and a leper hospital. During intervals of return to his native country Dr. Main took the Membership of the Royal College of Physicians at Edinburgh in 1901, proceeding to the Fellowship in 1905; in 1911 he joined the Royal College of Surgeons of Edinburgh as a Fellow. In addition to his active practical work he rendered valuable service to Chinese medicine by translating several medical works into Chinese, including Whitla's *Dictionary of Treatment*, Caird and Cathcart's *Surgical Handbook*, and Playfair's *Midwifery*. For his services to China he received various high decorations from the Republic; he was also decorated as a Fifth Class Mandarin by the Emperor of China in 1901. In 1927, after forty-five years of continuous work in China, he settled in Edinburgh, where he took considerable interest in the medical life of the city. The interment took place in the Dean Cemetery, Edinburgh, on September 4th.

We regret to announce the death of Dr. ANNIE T. LEIGH, the wife of Mr. J. R. Johnson of School Road, Sale, Cheshire. Dr. Leigh qualified M.B., Ch.B. in 1925 at Manchester, and took the diplomas of M.R.C.S. and L.R.C.P. in 1926. She devoted the whole of her time to anaesthetics, and before qualifying she began research work with the late Dr. S. R. Wilson, and continued with him in this work till his tragic death. Her first appointment was as visiting anaesthetist to the Manchester Royal Infirmary (Central Branch). After the

death of Dr. S. R. Wilson she was appointed to his post of honorary anaesthetist to the Manchester Dental Hospital, and was a member of the Board. At the time of her death Dr. Leigh was also honorary anaesthetist to St. Mary's Hospital, Whitworth Street, visiting anaesthetist to St. Mary's, High Street, and to the Northern Hospital for Women and Children. She had only recently been appointed by the Manchester Corporation as visiting anaesthetist to Booth Hall Infirmary. Dr. Leigh was also a medical examiner for the Sun Life of Canada Assurance Co., Ltd. She was the sister of Dr. Gertrude B. Leigh of Sunderland. Her death came as a great shock to her medical friends.

We regret to record the death of Dr. EDWARD BUXTON at Jersey on August 25th. Dr. Buxton qualified L.R.C.P.Ed. and M.R.C.S. in 1885, and took the diploma of M.R.C.P.Ed. in 1893 and F.R.C.S.Ed. in 1894, and the D.P.H. in 1892. In 1897 he received the degree of M.D.St.And. Dr. Buxton was an honorary life member of the St. John Ambulance Association, and had been a member of the British Medical Association for forty-eight years. At one time he was physician to the Nazareth House Orphanage, Great Crosby, and medical officer of health for the Little Crosby Urban District Council. He had retired from practice for some years. Dr. Buxton was of a genial disposition and had many friends. He leaves a widow, one son, and one daughter.

The death is announced, on August 10th, of Dr. RUDOLF BOLLING TEUSLER of St. Luke's International Hospital, Tokyo, who was one of the leading figures in the foreign community in Japan. Dr. Teusler, who was a cousin of Mrs. Woodrow Wilson, was born at Rome, Georgia, in 1876. He died at St. Luke's, the hospital and public health institution which he founded as a small eight-roomed mission hospital when he went to Japan for the American Episcopal Church in 1900. After graduating M.D. at the Medical College of Virginia he was in private practice and on the teaching staff of his college. His little hospital grew to a great institution, the training school for nurses being approved by the Japanese Government as the college for nurses. To Dr. Teusler more than to anyone else was due the raising of the status of the nursing profession in Japan, while he was also a pioneer with regard to children's clinics and the provision of visiting nurses in poor districts. In the earthquake of 1923 his hospital was destroyed, but the foundations for a new building, which had just been completed, remained intact, and the site became a refugee centre where medical aid of all sorts was given. The present buildings were opened and dedicated last year. In all his work Dr. Teusler was aided by a fine band of Japanese colleagues, who at the present time include leading specialists in almost every branch of medicine and surgery. It is illustrative of the regard for him that he was referred to by friends as "Sir Galahad." Teusler was decorated with the Fifth Class Order of the Rising Sun, the Russian Order of St. Vladimir, and the Czechoslovak war medal, which were awarded him for his work with the American Red Cross in Siberia from 1918 to 1921, and for the evacuation of Czech invalid prisoners from Siberia.

The following well-known foreign medical practitioners have recently died: Dr. EUGENIO TANZI, professor of psychiatry and neurology at Florence, aged 78; Professor E. JOSEPH, a Berlin urologist; Dr. GASCARD, professor at the Rouen medical school and national correspondent of the Académie de Médecine in the Section of Surgery; Dr. LOUSTE, general secretary of the Société Française de Dermatologie; Hofrat Professor Dr. HERMANN SCHLESINGER, head of the third medical department of the General Hospital at Vienna, aged 68; Dr. C. C. DELPRAT, a former editor of *Nederlansch Tijdschrift voor Geneeskunde*, aged 79; and Dr. ERNEST SCOTT, professor of pathology, Ohio State University College of Medicine, since 1915, aged 58.

Medical News

The annual prize distribution at St. George's Hospital Medical School will be held in the Board Room of the hospital on Monday, October 1st, at 3 p.m., when Professor W. Langdon Brown will deliver the inaugural address.

The Central London Throat, Nose, and Ear Hospital (Gray's Inn Road, W.C.) has arranged an intensive course in laryngology, rhinology, and otology from October 1st to 27th. The course includes an anatomy and physiology class, an operative surgery class, a practical course in peroral endoscopy, and a course in pathology and bacteriology (specially suitable for D.L.O. students). The fee for the whole course is £21, but classes may be taken separately. Full particulars may be obtained from the secretary-superintendent.

On Tuesday, September 18th, a play called "Muggleston on the Map," by A. V. Williams and Ernest Milligan, will be broadcast from the North Regional radio station (Manchester) in the night programme. This play is a municipal comedy, with a special appeal also to football "fans." Dr. Milligan is M.O.H. for the borough of Glossop, and "The Ballad Singer," an Ulster comedy written by him, was broadcast in 1933 from Belfast.

The jubilee meeting of the Medical Officers of Schools Association will be held at Eastbourne on Friday and Saturday, September 14th and 15th, by invitation of the mayor and council of the county borough of Eastbourne. There will be a paper by Dr. J. Alison Glover and Dr. Fred Griffith on "Acute Streptococcal Throat Infections," on September 15th, at 10 a.m., at the Town Hall, Grove Road, Eastbourne.

A lecture on the theory and practice of contraception will be given to medical students who have completed their gynaecological course and practitioners by Dr. Gladys Cox on Friday, September 14th, at 6 p.m., at the Walworth Women's Welfare Centre, 153A, East Street, S.E.17. Practical demonstrations will be given on each subsequent Friday till September 28th (inclusive). Tickets admitting to the lecture (5s.) are to be applied for in advance.

Instruction to post-graduates and medical students in the theory and practice of contraception will be given at the North Kensington Women's Welfare Centre (12, Telford Road, Ladbroke Grove, W.10) during the next three months. Particulars may be had from the secretary.

The Fellowship of Medicine and Post-Graduate Medical Association announces further lecture-demonstrations at 11, Chandos Street, W., at 2.30 p.m., on September 11th (chronic cough) and September 18th (hemiplegia). There will be a "refresher" course in medicine, surgery, and the specialties at the Westminster Hospital, from September 17th to 29th. Other forthcoming courses include diseases of the chest at the Brompton Hospital, September 24th to 29th, and, during the same period, proctology at the Gordon Hospital; diseases of children at the Queen's Hospital, October 1st to 13th; dermatology at St. John's Hospital, October 1st to 27th; physical medicine (evening course) at the St. John Clinic and Institute of Physical Medicine, October 1st to 27th; cardiology at the National Heart Hospital, October 8th to 20th; medicine, surgery, and the specialties at the Metropolitan Hospital, October 8th to 21st.

A conference of some of the leading paediatricians of the world will be held at Lyons on September 27th and 28th. The conference, which will deal specially with the prevention of malaria, rickets, and convulsions, has been organized by the International Association for Preventive Paediatrics, which is the medical section of the Save the Children International Union. The British representative on its council is Dr. Leonard Findlay.

The twelfth Rumanian Congress for oto-rhino-laryngology will be held at Bucarest from September 28th to 30th. Discussions have been arranged on thrombosis of the lateral sinus and balneotherapy in oto-rhino-laryngology.

According to a correspondent writing in the *Times* of September 5th Dr. W. von Brehmer, head of the anatomical laboratory of the Reich Biological Institute at Dahlem, believes that he has proved cancer to be a bacterial disease, having discovered, isolated, and transplanted a visible organism, to which he gives the name of *Siphonospora polymorpha*. This bacterium exists in close contact with the erythrocytes in cancerous subjects, and its discovery is associated with the observation that the disease occurs only in cases where the blood shows a strong alkaline content. Tumours have been produced in inoculated animals, and seven stages in the development of the organism are described.

The National Smoke Abatement Society announces that the sixth annual conference will be held at Glasgow, in conjunction with the Scottish Branch, on September 27th, 28th, and 29th. Papers will be read by Professor J. R. Currie, Dr. J. S. Owens, Messrs. W. J. Grassic, O. Cochran, W. D. Besant, and Dr. J. J. Jervis. The conference headquarters will be the North British Station Hotel, George Square ; further information may be obtained from the secretary, National Smoke Abatement Society, 36, King Street, Manchester.

The fifteenth congress of the Italian Paediatric Society will be held at Sienna from September 19th to 22nd, when the following subjects will be discussed: the autonomic nervous system in childhood, introduced by Drs. G. Careddu and B. Trambusti ; septicaemia in newborn infants, introduced by Drs. A. Bocchini, M. Gerbasi, and R. Vaglio ; and indications for climatotherapy in childhood, introduced by Drs. G. C. Bentivoglio, A. Foa, and L. Maghi.

The Societas Oto-rhino-laryngologica Latina will hold its fourth congress at Brussels from September 20th to 24th, under the presidency of Dr. Buys. Further information can be obtained from the secretary, Dr. Vues, Rue de Livourne 9, Brussels.

The annual congress of the Chartered Society of Massage and Medical Gymnastics will be held from September 24th to 28th, and all lectures and demonstrations will be given at Bedford College for Women, Regent's Park, N.W. Registered medical practitioners will be admitted free of charge to the lectures and demonstrations, for which a card of admission may be obtained from the offices of the society, Tavistock House (North), Tavistock Square, W.C. The annual dinner of the society will be held at the Café Royal, Regent Street, W., on Wednesday, September 26th, at 7.30 p.m. On Friday, September 28th, at 8.30 p.m., the Founders' Lecture will be delivered by Sir Humphry Rolleston, on "Occupational Diseases of Those in Attendance on the Sick."

The National Children's Home and Orphanage, whose head office is at Highbury Park, London, N.5, has issued invitations to the opening of the new wing at the sanatorium, Harpenden, on Saturday, September 22nd, at 2.45 p.m., by Dame Janet Campbell. The chair will be taken by Sir Thomas Barlow.

The address of the British Empire Leprosy Relief Association has been changed to 131, Baker Street, W.1 (telephone, Welbeck 5913).

We are asked to announce that the new edition of the *Belfast Hospitals' Pharmacopoeia*, revised and brought up to date with the collaboration of the medical profession and issued by the Ulster Retail Drug Trade Association, came into official use on September 1st. Copies are obtainable from the principal Belfast booksellers and wholesale drug establishments.

An epidemic of acute poliomyelitis, threatening to reach large proportions, is reported from Denmark, where cases have been notified in Faaborg, Odense, and elsewhere. Preventive measures have been adopted, and the Lister Institute, London, on a telegraphic request from Professor Madsen of Copenhagen, recently dispatched 800 ampoules of its anti-serum (horse). Given intramuscularly in 5 c.cm. doses this is believed to offer the best prophylaxis, giving passive immunity for about three weeks. Statistics illustrating its effect in the present epidemic will be awaited with interest.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, four lines).

The **TELEGRAPHIC ADDRESSES** are:

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin* ; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh* ; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Earth Burials and Disease

Dr. CHRISTOPHER ROLLESTON (Stamford) writes: I should be glad to know if there is any modern evidence that earth burials cause disease. On looking through the literature on the subject all the evidence seems to go back to the pre-bacteriological era. I should be glad to know whether any epidemics have been traced to this cause in recent years. I have Thompson's book on *Cremation*, but that, of course, is an ancient book.

Over-smoking

"E. T.-P." (Orpington), in reply to "F. C. R." (Sussex), writes: I found (when I was in general practice) invariable success with the following plan. Ascertain as exactly as possible how many cigarettes per day the patient smokes ; if this number was fifty direct him to fill his box or case first thing in the morning with forty-nine, carry that around with him, and make it do for that day. Repeat this process for perhaps two days, and on the third put only forty-eight in the case. As time goes on and the number per day decreases, the interval between the "decreases" must be *increased*. A smoker will not really notice the loss of one cigarette in one day when the difference is between fifty and forty-nine, but when he has dropped from forty-nine to forty-five he should keep at the forty-five for several days before dropping to forty-four, and so on. I would emphasize the importance of *exact* instruction as to the number of cigarettes and the number of days' interval, and of the personal interest of the doctor in asking for the patient's report as to how conscientiously the directions have been carried out. This method takes time ; in fact, it must be allowed to take so much time that the patient does not know he has been deprived of one cigarette every so many days.

Removal of Tattoo Marks

Dr. E. BAYLIS ASH (Birmingham) writes in reply to Dr. George Steane's inquiry: Three methods are available: (1) excision of the mark and skin grafting gives a moderately good result in small tattoo marks up to two inches square ; (2) freezing with CO_2 snow in fairly new tattoo marks results in a scarred area hardly discernible after a year ; (3) old tattoo marks, particularly those containing red and yellow pigments, are best removed with a fine spark of the diathermy needle. Numerous treatments are necessary, and the scar is rather more pitted than that from the CO_2, but quite good when examined after two years. The treatment is tedious, and requires a good deal of patience on the part of the medical man and the patient.

Income Tax

Expenses of Assistant

"J. K." was an assistant to August, 1932, using two rooms of his house for seeing patients; his maid had to answer the door and telephone. Since August, 1932, he has held another assistantship, his principal making it a condition that he rents the flat over the surgery and keeps a competent maid to answer telephone calls and take messages for the practice. He puts his car expenses at £150 a year, including depreciation, but excluding running costs during holidays.

*** The expenses of the maid's services are partly private and the amount deductible professionally is a fair proportion having regard, *inter alia*, to the time expended by her on the two classes of work. Probably one-third would not be unfair to "J. K." as a professional charge. As regards the rent the same proportion might be claimed in the first case, but in his present circumstances apparently no part of the flat is used for the reception of patients and no part of the rent will be allowed. Apparently practically the whole of the £150 car expenses will be allowable, but "J. K." will have to show the amount of depreciation claimed as a separate item, and some slight restriction of that claim may be due in respect of holiday use of the car.

LETTERS, NOTES, ETC.

English Children in the Alps

The Queen Alexandra Sanatorium Fund, which owes its origin to the appeal for an English sanatorium in Davos made by the late Lord Balfour of Burleigh thirty years ago, has investments valued at £64,000 and an annual income of about £2,400. Since the sanatorium was given up as a war-time necessity the income has been used to enable patients of small means suffering from curable tuberculosis to stay long enough in Davos to make a substantial recovery. Last year the number of suitable cases applying was not very large, and it was possible to extend the grants for more than the usual five or six months on medical advice in Davos; but the council of the fund in London recognizes that a limited stay in the Alps, particularly if it must be followed by a return to straitened conditions at home, does not produce the best possible return for expenditure. For the last two years the council has had an object-lesson of a different kind in the Davos Valley. By the generosity of the president of the Birmingham Children's Hospital, acting in concert with its staff, a group of forty or more Birmingham children have spent several months in the Alps, with results which have been critically watched by a number of British and foreign paediatricians. About one-half of these children had had various forms of surgical tuberculosis; the remainder illnesses such as asthma, interstitial pneumonia, recurrent bronchitis, debility, and malnutrition after prolonged ill-health. When last reported, of the eighty children who had been to Switzerland forty-one were discharged "cured" after a stay averaging seven months, and at a weekly cost per patient of £2 2s. 6d. The experiment having surpassed the expectations of its promoters, the council of the Queen Alexandra Fund, a year ago, adopted the principle of helping children. At that time negotiations for collaboration with the Birmingham scheme did not mature and the money was allowed to accumulate, so that for the coming year there is a larger balance, and the council has agreed to allot, if suitable cases offer, as much as half its available income for the purpose. No hard-and-fast rules have yet been laid down as to the qualifications for a child candidate. The fund's honorary examining physicians in London will decide on its merits any application received for help from the fund, which now has the benefit of the advice of Professor L. G. Parsons, who was elected a member of council at the recent meeting. Practitioners with youthful patients who would, they think, benefit under the scheme may obtain further information from the honorary secretary of the council, Mr. A. Stanley Herbert, 25, Birchin Lane, E.C.3, or from the local secretary, Mr. W. G. Lockett, Davos-platz, Switzerland.

Conan Doyle, Bell, and Laycock

Dr. T. JOHNSTONE (Ilkley) writes: We have heard much of Sir A. Conan Doyle and Mr. Joseph Bell, but nothing from either as to who was Joe Bell's teacher. He was Professor Laycock, the first Englishman appointed to a medical chair in the University of Edinburgh, and who, all his life, was simply persecuted by some of his colleagues, both privately and in public. Their behaviour is recorded in a book or collection by the late Dr. Stark Currie, and was presented by me to the library, Morningside Mental Hospital, then under the care of Professor Robertson, who intended, had he lived, to produce a lecture on, or short biography of, Laycock. He was a remarkable man, a teacher at the old York medical school, where his pupils included Sir Jonathan Hutchinson and Hughlings Jackson, and he was friendly to Sir Clifford Allbutt. In Edinburgh he inspired, and had his full share in teaching, such men as Sir David Ferrier, Sir Dyce Duckworth, and Sir Lauder Brunton. Laycock was a pioneer in psychology and mental ailments, and did much to simplify the lunacy laws. He taught that people could carry the "poison" of diphtheria and give it to others, though they themselves escaped. He drew our attention to the effects of poisons on the nervous system after the exanthemata or injuries, and, instead of shell-shock, we were taught of "cannon fever" as the cause of nervous troubles after a war. Some of his teachings were wonderful, and time has verified many. He used to teach us physiognomical diagnosis and many other things, by observation and inference. I wonder what he thought of Joe Bell? Time, education, and evolution have widened the outlook of the men who select the medical professors at my old university, and I will merely mention my old teachers, Sir William Turner and Lord Lister.

"Praise and Dispraise of Doctors"

Dr. J. N. DUGDALE (Johore Bahru, Malaya) writes: I was interested to read (*Journal*, June 30th, p. 1172) the quotation of the Latin epigram attributed to Euricius Cordus in Dr. Hutchison's illuminating MacAlister Lecture. It reads: "Three faces the physician hath . . . first as an angel . . . next . . . a god . . . and last of all . . . a very fiend of hell." Some time ago a Chinese patient described to me a cartoon in a Chinese paper in which the physician is depicted as an angel on arrival at the sick-bed, a god on recovery of the patient, but as a demon when he sent in the bill! Many Chinese maxims are similar to our own, and it would be interesting to know if they had a common origin.

Transport of Invalids by Railway

Dr. MAURICE CAMPBELL (London, W.1) writes: In these days, when motors are almost universal, I am not sure if doctors realize how easily patients can travel by train. Recently a friend of mine had to come from Manchester to London, and I was surprised at the comfort, or even luxury, of the invalid coach. He was, indeed, more shaken in a ten-mile motor ambulance journey than on the rest of the way. He had the additional advantages of meals and of seeing the country after many weeks in bed, and greatly enjoyed the day. Patients may be deterred by the thought of the cost, but this was most reasonable. I am sure no one who has experience of this will ever be willing to travel any other way.

Autoclaving of Gum-elastic Catheters

Dr. MALCOLM BAILLIE (Urological Department, King's College Hospital, S.E.5) writes: We have found that the brown gum-elastic Eynard urethral catheters will stand indefinitely repeated autoclaving, and when cool have lost none of their stiffness. This method of sterilization recommends itself by its saving of labour and killing of all organisms, including spores.

Surgical Films at the Annual Meeting

Acknowledgement

In the Section of Surgery at the Annual Meeting of the British Medical Association at Bournemouth cinematographic films were lent by Sir John Thomson-Walker, Mr. Tudor Edwards, and Professor G. Grey Turner, dealing respectively with prostatectomy, lobectomy, and construction of an extrathoracic oesophagus after oesophagectomy. These were highly appreciated on the several occasions on which they were shown.

The Medical Supply Association, Ltd. (167–73, Gray's Inn Road, W.C.1), inform us that they are opening new showrooms at 95, Wimpole Street, W.1 (opposite the Royal Society of Medicine).

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 35, 36, 37, 38, 39, 42, and 43 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 40 and 41.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *164*.